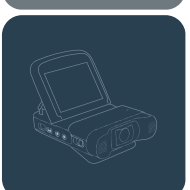
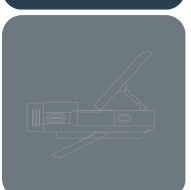
Canon

PUB. DIE-0455-000C

HD Camcorder
Instruction Manual

PAL





LEGRIA
mini X

Wi Fi CERTIFIED

HDMI AVCHD MP4

Important Usage Instructions

COPYRIGHT WARNING:
Unauthorized recording of copyrighted materials may infringe on the rights of copyright owners and be contrary to copyright laws.

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK AND TO REDUCE ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

CAUTION:
DISCONNECT THE MAINS PLUG FROM THE SUPPLY SOCKET WHEN NOT IN USE.

To reduce the risk of electric shock, do not expose this product to dripping or splashing.

The Mains plug is used as the disconnect device. The Mains plug shall remain readily operable to disconnect the plug in case of an accident.

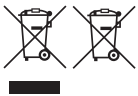
CA-110E identification plate is located on the bottom.

Complies with IDA Standards DB00761

This product is installed with the WLAN Module which is certified to standards set by IDA Singapore.

While using the compact power adapter, do not wrap it or cover it with a piece of cloth, and do not place it in confined narrow spaces.

Only for European Union and EEA (Norway, Iceland and Liechtenstein)



These symbols indicate that this product is not to be disposed of with your household waste, according to the WEEE Directive (2012/19/EU), the Battery Directive (2006/66/EC) and/or national legislation implementing those Directives.
If a chemical symbol is printed beneath the symbol shown above, in accordance with the Battery Directive, this indicates that a heavy metal (Hg = Mercury, Cd = Cadmium, Pb = Lead) is present in this battery or accumulator at a concentration above an applicable threshold specified in the Battery Directive.

This product should be handed over to a designated collection point, e.g., on an authorized one-for-one basis when you buy a new similar product or to an authorized collection site for recycling waste electrical and electronic equipment (EEE) and batteries and accumulators. Improper handling of this type of waste could have a possible impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. Your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources.
For more information about the recycling of this product, please contact your local city office, waste authority, approved scheme or your household waste disposal service or visit www.canon-europe.com/weee, or www.canon-europe.com/battery.

REGIONS OF USE

The LEGRIA mini X is in compliance (as of January 2014) with the radio signal regulations of the regions listed below. For details on other regions where it can be used, make inquiries with the contacts listed at the end of this instruction manual (📖 304).

REGIONS
Australia, Austria, Belgium, Bulgaria, China (PRC mainland), Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong S.A.R., Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom

Statement on EC directive

Hereby, Canon Inc., declares that this RF401 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Please contact the following address for the original Declaration of Conformity:
CANON EUROPA N.V.
Bovenkerkerweg 59, 1185 XB Amstelveen, The Netherlands
CANON INC.
30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501, Japan

Model
ID0037: LEGRIA mini X

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- IOS is a trademark or registered trademark of Cisco in the U.S. and other countries and is used under license.
- Wi-Fi is a registered trademark of the Wi-Fi Alliance.
- Wi-Fi Certified, WPA, WPA2, and the Wi-Fi Certified logo are trademarks of the Wi-Fi Alliance.
- WPS as used on the camcorder's settings, onscreen displays and in this manual signifies Wi-Fi Protected Setup.
- The Wi-Fi Protected Setup Identifier Mark is a mark of the Wi-Fi Alliance.
- Other names and products not mentioned above may be trademarks or registered trademarks of their respective companies.
- This device incorporates exFAT technology licensed from Microsoft.
- "Full HD 1080" refers to Canon camcorders compliant with high-definition video composed of 1,080 vertical pixels (scanning lines).
- This product is licensed under AT&T patents for the MPEG-4 standard and may be used for encoding MPEG-4 compliant video and/or decoding MPEG-4 compliant video that was encoded only (1) for a personal and non-commercial purpose or (2) by a video provider licensed under the AT&T patents to provide MPEG-4 compliant video. No license is granted or implied for any other use for MPEG-4 standard.

About this Manual and Camcorder

Thank you for purchasing the Canon LEGRIA mini X. Please read this manual carefully before you use the camcorder and retain it for future reference. Should your camcorder fail to operate correctly, refer to **Troubleshooting** (📖 246).

Conventions Used in this Manual

- Important precautions related to the camcorder's operation.
- Additional notes and topics that complement the basic operating procedures.
- Restrictions, requirements or preconditions regarding the function described.
- Reference page number within this manual.
- This arrow is used to abbreviate menu selections. For a detailed explanation on how to use the menus, refer to **Using the Menus** (📖 46).

- "Scene" refers to one movie unit from the point you press the start/stop button or touch [●] to start recording until you press the start/stop button or touch [■] to stop recording.
- Brackets [ ] are used to refer to onscreen controls you need to touch (menus, buttons, etc.) and to messages as they are displayed on the screen.

- The photos included in this manual are simulated pictures taken with a still camera.
- Illustrations of the camcorder's screen or a computer's screen included in this manual may show only relevant parts of the screen.
- **Navigation buttons:** The navigation bar at the bottom of the page offers up to four buttons to let you get quickly to the information you want to find.

Jump to the general table of contents.

Go to a list of select functions grouped by their uses in real-life situations. This alternative index can be very useful for beginners who encounter a particular challenge but are not sure of what function to use.

Jump to the alphabetical index.

The button with a number in it will take you to the beginning of the current chapter, where you will find an overview of the information and related functions covered in that chapter. Note that the icon itself will change depending on the chapter you are currently reading.

- Observe the following precautions while the camcorder's ACCESS indicator is on or flashing. Failing to do so may result in permanent data loss or damage to the memory card.
  - Do not open the memory card slot cover.
  - Do not disconnect the power source or turn off the camcorder.
  - Do not press and hold the ▶ button.

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The Camcorder's Functions in Real-Life Situations

Unique functions for special cases

Change the field of view you record from a fisheye-like ultra wide angle to a close-up center view.

▶ Field of View (📖 59)

Record the best sound possible according to your shooting situation, such as at a business meeting or musical performance.

▶ Audio Scenes (📖 118)

Shoot a cool time-lapse video or use slow motion to check your golf swing.

▶ Interval Recording (📖 97)
▶ Slow and Fast Motion Recording (📖 101)

Record a mirror image of your dance training so you can practice along with the playback scene.

▶ Automatic Image Rotation and Image Flipping (📖 113)

Decorate movies with graphics and stamps.

▶ Decoration (📖 109)

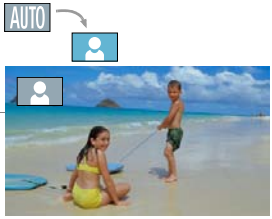
Create a dynamic montage sequence with short cuts.

▶ Video Snapshot (📖 104)

Getting the look you want

Get gorgeous video and photos without bothering with settings.

▶ AUTO mode (📖 57)



Make the image brighter or darker than the exposure set by the camcorder.

▶ Exposure (📖 141)

Create a copy of your movies applying a unique cinematic filter.

▶ Converting and Resizing Movies (📖 156)

Cinema filter
[FILTER 2] (Vivid)

Choose whether to record in AVCHD or MP4 format.

▶ Selecting the Recording Format (📖 55)

Challenging subjects and shooting conditions

Shoot great video of special scene situations with minimal settings.

▶ Shooting Modes (📖 93)

Obtain natural-looking colors even under special lighting conditions.

▶ White Balance (📖 139)

Optimize the exposure for the desired subject just by touching the screen.

▶ Touch AE (📖 143)

Keep the exposure optimized while shooting a moving subject.

▶ Face Detection and Tracking (📖 144)

Give yourself time to get in the picture.

▶ Self Timer (📖 108)

Playback, editing and others

Save parts of your video as photos or short video snapshot scenes.

▶ Capturing Photos/Video Snapshot Scenes (📖 147)

Convert your scenes into a smaller file size to upload to the Web.

▶ Converting Movies to MP4 Format (📖 156)

Play a slideshow of your photos.

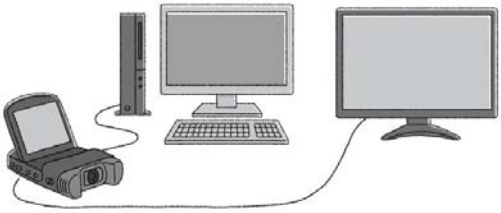
▶ Slideshow (📖 86)

Enjoy your recordings on a TV.

▶ HDMI Connection (📖 152)
▶ Playback (📖 154)

Save recordings on your computer and upload them to the Web.

▶ Saving Recordings (📖 159)



Wireless functions

Use your smartphone or tablet as a remote control while recording.

▶ Wi-Fi Remote Control (CameraAccess plus) (📖 178)

Use a Web browser on your smartphone or tablet to access and play back the recordings in the camcorder.

▶ Remote Browse/Playback via Browser (📖 188)

Use an iOS app to wirelessly transfer recordings to your iPhone/iPad and upload them to the Web.

▶ Movie Uploader (📖 191)

Share your recordings with Web albums using CANON iMAGE GATEWAY.

▶ CANON iMAGE GATEWAY (📖 193)

Connect the camcorder to your home network and wirelessly stream your recordings.

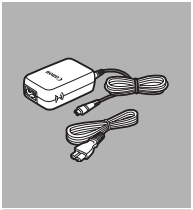
▶ Media Server (📖 201)
▶ Wi-Fi Connection to an Access Point (📖 204)

Review and change Wi-Fi settings (for advanced users).

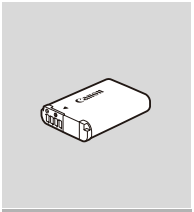
▶ Wi-Fi Settings (📖 213)

Supplied Accessories

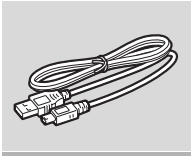
The following accessories are supplied with the camcorder:



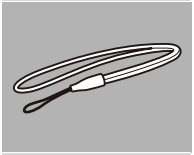
▶CA-110E Compact Power Adapter
(incl. power cord)



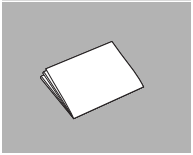
NB-12L Battery Pack◀



▶IFC-300PCU/S USB Cable



WS-DC11 Wrist Strap◀



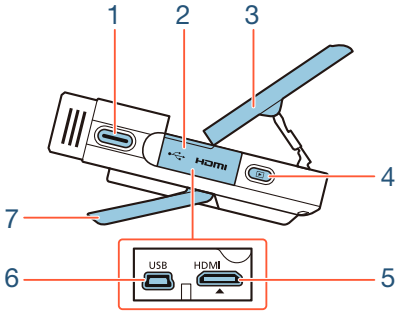
▶Getting Started Leaflet

Transfer Utility LE
Startup Guide*◀

* This guide explains how to download PIXELA's **Transfer Utility LE** software, which allows you to save your AVCHD movies to a memory card. For details on using the software, refer to the Transfer Utility LE Software Guide included with the downloaded software.

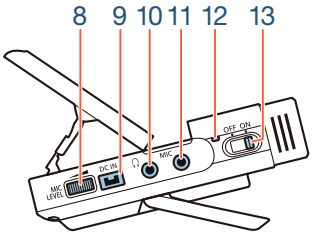
Names of Parts

Left side view



1 Start/Stop button (📖 57, 62)
2 Terminal cover
3 LCD panel (📖 26)
4 ▶ (playback mode) button (📖 67)
5 HDMI terminal (📖 151, 152)
6 USB terminal (📖 151, 153)
7 Adjustable stand (📖 26)

Right side view



8 MIC LEVEL dial (124)

9 DC IN terminal (30)

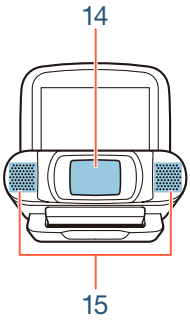
10 (headphones) terminal (137)

11 MIC terminal (116)

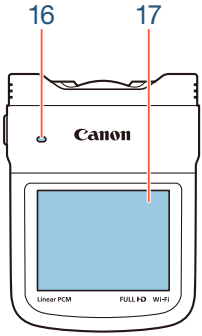
12 Power/Charge indicator (30)

13 Power switch (ON/OFF) (57, 62)

Front view



Top view



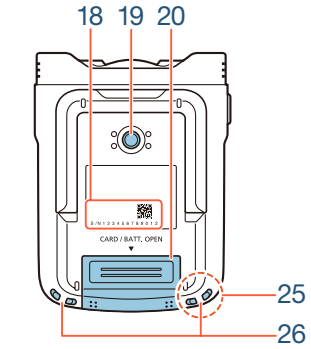
14 Lens cover

15 Stereo microphone (118)

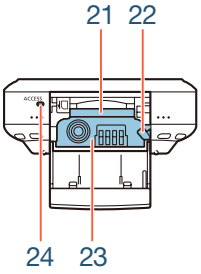
16 Speaker (69)

17 LCD touch screen (27, 45)

Bottom view



Back view



18 Serial number

19 Tripod socket (📖 278)

20 Memory card slot/Battery compartment cover (📖 37)

21 Memory card slot (📖 37)

22 Battery release latch (📖 30)

23 Battery compartment (📖 30)

24 ACCESS indicator (📖 57, 62)

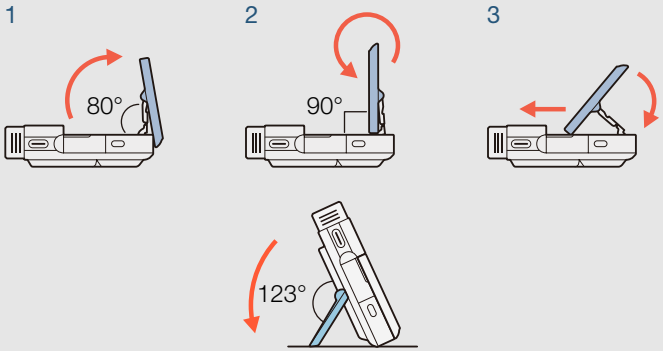
25 Wi-Fi antenna (📖 172)

26 Strap mounts (📖 27)

Adjusting the camcorder's position

The camcorder has an adjustable stand (**7**) and an articulated LCD panel (**3**) that allow you to easily adjust its position to match your recording conditions.

Here are typical shooting positions (all degree measurements are approximate):



17 LCD touch screen

- The screen is produced using extremely high-precision manufacturing techniques, with more than 99.99% of the pixels operating to specification. Less than 0.01% of the pixels may occasionally misfire or appear as black, red, blue or green dots. This has no effect on the recorded image and does not constitute a malfunction.
- For details about how to take care of the touch screen, refer to **Handling Precautions** (📖 276), **Cleaning** (📖 283).
- You can adjust the screen's brightness using the [FUNC] > [LCD Brightness] and [LCD Backlight] settings.

26 Strap mounts

You can attach the supplied wrist strap to either side of the camcorder.

Preparations

Charging the Battery Pack

30 The first step for using your camcorder is to prepare the power supply. This section explains how to charge a battery pack.

Using a Memory Card

35 Next, you need to prepare a memory card where your movies and photos will be recorded. This section explains the types of memory cards that can be used and how to insert one into the camcorder.

First Time Settings

39 Now that your camcorder is powered up and has a memory card, you can turn it on and complete the basic setup. These include selecting the camcorder's language and setting the date and time.

Basic Operation of the Camcorder

45

In this section you can learn more about basic operations, such as using the touch screen, changing operating modes and using the menus.

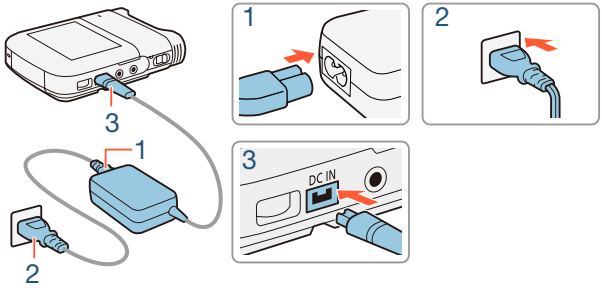
Selecting the Movie Recording Format (AVCHD/MP4)

55

Before you begin recording, you can select whether to record in AVCHD or MP4 format.

Charging the Battery Pack

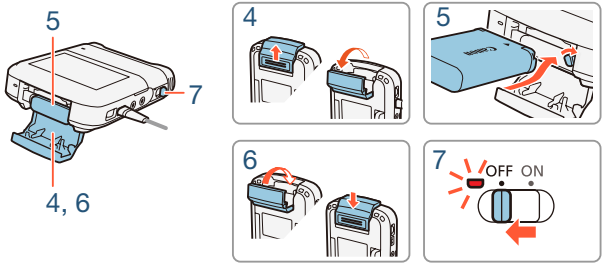
The camcorder can be powered with a battery pack or directly using the compact power adapter.
For approximate charging times and recording/playback times with a fully charged battery pack, refer to **Charging Times** (298).



1 Connect the power cord to the compact power adapter.

2 Plug the power cord into a power outlet.

3 Connect the compact power adapter to the camcorder's DC IN terminal.



4 Push the battery compartment cover in the direction of the arrow to open it.

5 Insert the battery pack with the Canon label facing the top of the camcorder.

- When inserting the battery pack, push it up against the battery release latch. Next, push it all the way in until the battery release latch secures it in place.

6 Close the battery compartment cover.

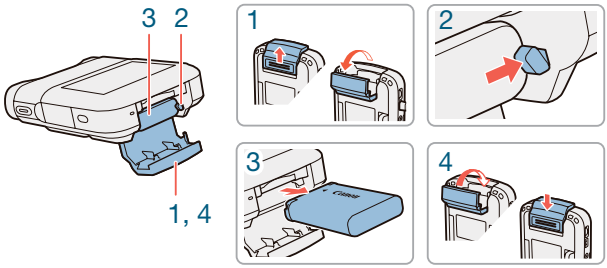
- Push the cover until you hear a click. Do not force the cover closed if the battery pack is not correctly inserted.

7 Charging will start when the camcorder is turned off.

- If the camcorder was on, the green power/charge indicator will go out when you turn off the camcorder. After a moment, the power/charge indicator will turn on in red (battery pack charging). The red power/charge indicator will go out when the battery pack is fully charged.
- If the indicator flashes, refer to **Troubleshooting** (📖 246).

To remove the battery pack

Open the battery compartment cover and slide the battery release latch in the direction of the arrow so the battery pack springs out. Remove the battery pack and close the cover.



- Turn off the camcorder before connecting or disconnecting the compact power adapter. After turning off the camcorder, important data is updated in the memory. Be sure to wait until the green power/charge indicator goes out.
- Do not connect to the camcorder's DC IN terminal or to the compact power adapter any electrical equipment that is not expressly recommended for use with this camcorder.
- When inserting the battery pack, do not force it in to the battery compartment as this may cause damage.
- To prevent equipment breakdowns and excessive heating, do not connect the supplied compact power adapter to voltage converters for overseas travels or special power sources such as those on aircraft and ships, DC-AC inverters, etc.

- We recommend charging the battery pack in temperatures between 10 °C and 30 °C. If either the ambient temperature or the battery pack's temperature is outside the range of approx. 0 °C to 40 °C, charging will not start.
- If the ambient temperature or the battery pack's temperature is low, charging may take longer than usual.

- The battery pack will be charged only when the camcorder is off.
- If the power supply was disconnected while charging a battery pack, make sure the power/charge indicator has gone out before restoring the power supply.
- If remaining battery time is an issue, you can power the camcorder using the compact power adapter so the battery pack will not be consumed.
- Charged battery packs continue to discharge naturally. Therefore, charge them on the day of use, or the day before, to ensure a full charge.
- We recommend that you prepare battery packs to last 2 to 3 times longer than you think you might need.
- You can use an optional battery charger to charge the battery pack. For details on charging times, refer to **Charging Times** (📖 298).

Using a Memory Card

Memory Cards Compatible for Use with the Camcorder

You can use the following types of commercially available SD cards with this camcorder. We recommend using memory cards rated CLASS 4, 6 or 10.
As of November 2013, the movie recording function has been tested using SD/SDHC/SDXC cards made by Panasonic, Toshiba and SanDisk. For the latest information on memory cards that can be used, visit your local Canon Web site.

Memory card type:	**SD card**
	SDHC card
	SDXC card
SD Speed Class*:	**CLASS 4 or better**

* When using an SD memory card without a Speed Class rating or one rated CLASS 2, you may not be able to record movies, depending on the memory card used.

- After repeatedly recording, deleting and editing scenes (fragmented memory), it will take longer to write data on the memory card and recording may stop. Back up your recordings and initialize the memory card using the [Complete Initialization] option.

- **About the Speed Class:** Speed Class is a standard that indicates the minimum guaranteed data transfer speed of memory cards. When you buy a new memory card, look for the Speed Class logo on the package.

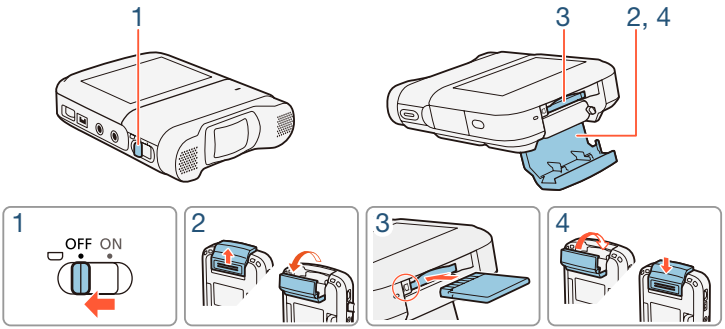
SDXC Cards

You can use SDXC cards with this camcorder. When using SDXC cards with other devices, such as digital recorders, computers and card readers, **make sure that the external device is compatible with SDXC cards**. For more information on compatibility, contact the computer, operating system or memory card manufacturer.

- If you use a SDXC card with a computer OS that is not SDXC-compatible, you may be prompted to format the memory card. In such case, **cancel the operation to prevent data loss**.

Inserting and Removing a Memory Card

Make sure to initialize all memory cards with the camcorder, using the [Complete Initialization] option, before using them for the first time. When you turn on the camcorder for the first time, you will need to complete the basic setup first (39), and then initialize the memory card (43).



1 Turn off the camcorder.

- Set the power switch to OFF and check that the power/charge indicator is off.

2 Open the memory card slot cover.

3 Insert the memory card with the label facing down and push it all the way into the memory card slot until it clicks.

4 Close the memory card slot cover.

- Do not force the cover closed if the memory card is not correctly inserted.

To remove the memory card

Push the memory card once to release it. When the memory card springs out, pull it all the way out.

- Memory cards have front and back sides that are not interchangeable. Inserting a memory card facing the wrong direction can cause a malfunction of the camcorder. Be sure to insert the memory card as described in step 3.

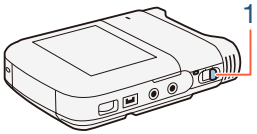
First Time Settings

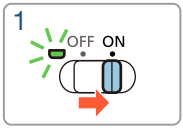
Basic Setup

The first time you turn on the camcorder, you will be guided by the camcorder's basic setup screens to select the camcorder's language and set the date and time. For details on how to use the touch screen, refer to **Using the Touch Screen** (45).

1 Set the power switch to ON to turn on the camcorder.

- The lens cover will open.





- The language selection screen will appear.
- After the power/charge indicator turns on in green, it will go out.

2 Touch the language that you want to be used for onscreen displays and then touch [▷].

- You can select one of 27 languages. You may need to scroll down to find your language.
- After you select a language, the [Date Format] screen will appear.

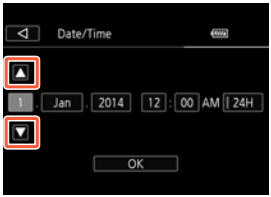
Touch [▷] after selecting a language

3 Touch [Y.M.D], [M.D,Y] or [D.M.Y] to select the date format you prefer and then touch [▷].

- After you select the date format, the [Date/Time] screen will appear with the first field selected.

4 Touch a field you want to change (year, month, day, hours or minutes).

5 Touch [▲] or [▼] to change the field as necessary.



6 Set the correct date and time by changing all the fields in the same way.

- Touch [24H] to use 24-hour clock or leave it unselected to use 12-hour clock (AM/PM).

7 Touch [OK] to complete the basic setup and close the setup screen.

- Some buttons, such as [ON]/[OFF] in some screens, will appear in English regardless of the language selected.
- You can change the language and adjust the date and time later on, using the following menu settings.
  - [Language]
  - [Date/Time]
- When you do not use the camcorder for about 3 months, the built-in rechargeable lithium battery may discharge completely and the date and time setting may be lost. In such case, recharge the built-in lithium battery (📖 282). The next time you turn on the camcorder, you will have to perform the basic setup again.

Changing the Time Zone

Change the time zone to match your location. The default setting is Paris. In addition, the camcorder is able to retain the date and time of another location. This is convenient when you travel so that you can set the camcorder to match the time of your home location or that of your destination.

This section requires using the camcorder's menus. For details about how to use the menus, refer to **Using the Menus** (📖 46).

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Open the [Time Zone/DST] screen.

[Home] ▸ [Other Settings] ▸ [Setup] ▸ [Time Zone/DST]

2 Touch [🏠] to set the home time zone, or [✈] to set the time zone of your destination when you are traveling.

3 Touch [▲] or [▼] to set the desired time zone. If necessary, touch [☀] to adjust for daylight saving time.

4 Touch [✕] to close the menu.

Initializing a Memory Card

Initialize memory cards when you use them with this camcorder for the first time. You can also initialize a memory card to permanently delete all the recordings it contains.

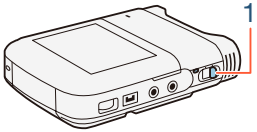
Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

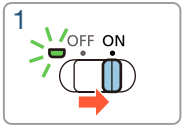
1 Power the camcorder using the compact power adapter.

- Do not disconnect the power source or turn off the camcorder until the initialization is completed.

2 Set the power switch to ON to turn on the camcorder.

- The lens cover will open.
- After the power/charge indicator turns on in green, it will go out.





3 Initialize the memory card.

[Other Settings] ▸ [Initialize SD] ▸ [Initialize] ▸ [Complete Initialization][1] ▸ [Yes][2] ▸ [OK] ▸ [✕]

[1] Touch this option if you want to physically erase all the data rather than just clear the file allocation table of the memory card.

[2] If you selected the [Complete Initialization] option, you can touch [Cancel] to cancel the initialization while it is in progress. All recordings will be erased and the memory card can be used without any problem.

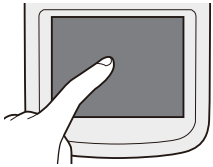
- Initializing a memory card will permanently erase all recordings. Lost original recordings cannot be recovered. Make sure you save important recordings in advance (📖 159).

Basic Operation of the Camcorder

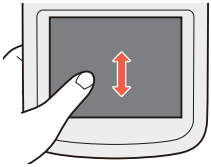
Using the Touch Screen

The buttons and menu items that appear on the touch screen change dynamically depending on the operating mode and the task you are performing. With the intuitive touch screen interface you have all the controls at your fingertips.

1



2



1 Touch

Touch on an element displayed on the touch screen.
Used to start playing back a scene in an index screen, to select a setting from the menus, etc.

2 Drag

While touching the screen, swipe your finger up and down or left and right across the screen.
Used to scroll menus, to browse through index screen pages or to adjust slider controls like the volume.

- In the following cases, you may not be able to perform touch operations correctly.
  - Using your fingernails or hard-tipped objects, such as ballpoint pens.
  - Operating the touch screen with wet or gloved hands.
  - Applying excessive force with your finger.

Using the Menus

The (Home) menu is the gateway to most of the camcorder's functions and settings. In recording mode, the (Home) menu offers immediate access to some frequently used functions. In playback mode, it is from the (Home) menu that you will switch between the movies' and photos' index screens. In both modes, from the (Home) menu you can open the [Other Settings] menus for more detailed settings, and also access the camcorder's various Wi-Fi functions.

(Home) Menu

Recording mode

Playback mode

1. Touch [ ] on the bottom left corner (recording mode) or top left corner (playback mode) of the screen to open the (Home) menu.
2. Drag your finger left/right to bring the desired menu to the center.
3. Touch the icon of the desired menu to open it.
   - See the following table for a description of each menu.

Menu item Description	
[Other Settings] Opens the [Other Settings] menus, which give you access to various camcorder settings.	(📖 51, 222)
[Audio Scene]* (recording mode only) Optimize audio settings for your surroundings to get the best possible sound.	(📖 118)
[Special Rec Modes]* (recording mode only) Enjoy special recording modes, like slow and fast motion and interval recording, to achieve unique effects.	(📖 97)
[Shooting Mode]* (recording mode only) The camcorder features a number of shooting modes that offer the most appropriate settings for a variety of special scenes.	(📖 93)
[Flip/Rotate Image] (recording mode only) You can have the camcorder record a mirror image (flipped horizontally) or automatically detect its position to rotate the image during playback.	(📖 113)

* For these menu items, the icon shown in the (Home) menu indicates, respectively, the audio scene, special recording mode or shooting mode currently selected.

Menu item Description	
[Self Timer] (recording mode only) Convenient function to give you time to get in the picture after setting up the camcorder.	(📖 108)
[Remote Control+Streaming] (recording mode only) Use your smartphone or tablet as a remote control to record with the camcorder. You can also stream video from the camcorder and record it on the smartphone or tablet.	(📖 178)
[Photo Playback] (playback mode only) Switches the camcorder to photo playback mode and opens the [] index screen.	(📖 75)
[AVCHD Movie Playback] (playback mode only) Switches the camcorder to playback mode for AVCHD movies and opens the [AVCHD] index screen.	(📖 67)
[MP4 Movie Playback] (playback mode only) Switches the camcorder to playback mode for MP4 movies and opens the [MP4] index screen.	(📖 67)
[MP4 Video Snapshot] (playback mode only) Switches the camcorder to movie playback mode and opens the [MP4] index screen, which displays only your MP4 video snapshot scenes.	(📖 67)

Menu item Description	
[Wi-Fi] (playback mode only) Allows you to access the various Wi-Fi functions, such as uploading recordings to the Web or playing back recordings using a smartphone.	(📖 170)

Using the Menus

Changing the camcorder's various settings using the menus is very easy. You make your selection simply by touching the button of the desired option. When they appear on the screen, you can touch [↩] to return to the previous screen or [✕] to close the menu.

In some screens, you will need to scroll to find the desired option.

Meeting
Records multiple voices so that the audience can differentiate them as if they were there. Ideal for recording meetings.
OK

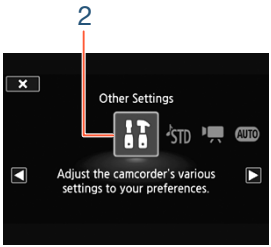
Some screens provide additional information about the options. In that case, simply drag your finger up and down along the column of icons.

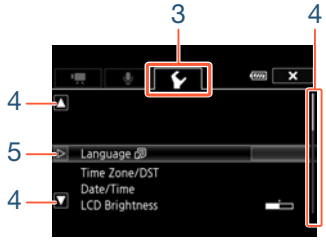
The [Other Settings] Menu

The [Other Settings] menus offer many options to control various aspects of the camcorder's operation. For details, refer to the complete list of settings in the appendix **[Other Settings] Menus** (222).

In the [Other Settings] menus, settings are organized under submenus (tabs). For brevity's sake, these settings are referenced throughout the manual like this: " [Language]". In this example (to change the language), you will need to do the following:

1. Touch [ ] to open the (Home) menu.
2. Drag your finger left/right to bring [Other Settings] to the center. Then, touch the icon to open the [Other Settings] menus.
   - You can also use the [◀] and [▶] icons for scrolling.





3 Touch the tab of the desired menu.

4 Drag your finger up/down to bring the setting you want to change into the orange selection bar.

- You can also use the [▲] and [▼] icons for scrolling.
- Menu items not available appear grayed out.
- You can touch any menu item on the screen to bring it directly into the selection bar.

5 When the desired menu item is inside the selection bar, touch [▷].

6 Touch the desired option and touch [✕].

- You can touch [✕] to close the menu at any time.

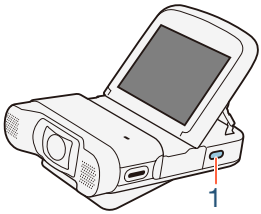
Operating Modes

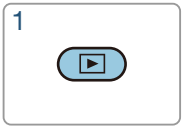
In this manual, the camcorder's operating modes are indicated with a bar of icons. A full icon in blue (AUTO) indicates that the function described can be used in that particular operating mode; a grayed-out icon ( ) indicates the function is not available in that operating mode. Icons are divided into movie format (55), shooting modes and playback modes.

Recording

When you set the power switch to ON, the camcorder will turn on in recording mode. In recording mode, the camcorder's operating mode is determined by the selected shooting mode (93). The shooting mode icons are the same icons used in the shooting mode selection screen.

Playback





Press and hold the ▶ button to switch the camcorder between recording mode and playback mode.
In the bar of operating mode icons, the icon refers to playing back movies, whether from the [AVCHD] or [MP4] index screen (all AVCHD or MP4 scenes) or from the [MP4] index screen (only MP4 video snapshot scenes) (📖 67). The icon refers to viewing photos from the [ ] index screen (📖 75).

Selecting the Movie Recording Format (AVCHD/MP4)

You can choose to record movies in AVCHD or MP4 format. AVCHD movies are ideal for copying to an external device such as a Blu-Ray Disc recorder. MP4 movies are versatile and can easily be played back on smartphones or uploaded to the Web.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

[Other Settings] > [Movie Format] > Desired movie format > [✕]

Basic Recording and Playback

Basic Recording

57

This section covers how to easily record video and photos and explains the convenient AUTO mode. To record using other shooting modes, use more advanced functions and enjoy full access to all menu settings, refer to **Advanced Functions** (88).

Basic Playback

67

This section covers how to play back, trim, delete and divide movies and how to view photos (including in slide-show mode) and delete them.

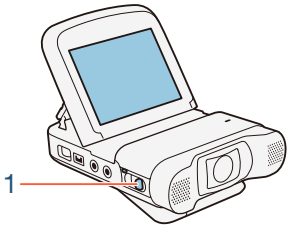
Basic Recording

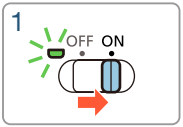
Recording Video

You are now ready to record movies. Because the camcorder uses an ultra wide angle lens, you can even change the field of view (ultra wide or close up). You can also select a different shooting mode according to the shooting conditions (93).

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

- **Before you begin recording,** make a test recording first to check that the camcorder is operating correctly.

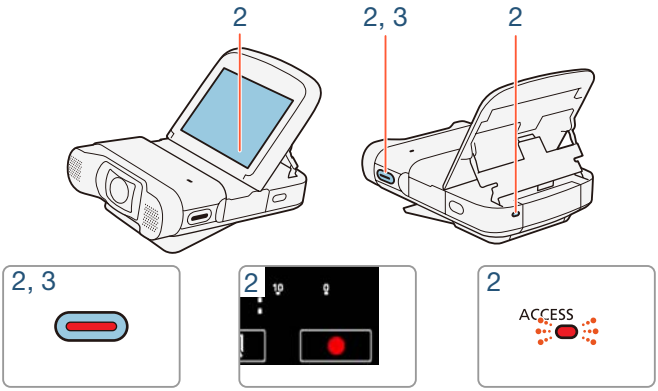




1 Set the power switch to ON to turn on the camcorder.

- The lens cover will open.

- After the power/charge indicator turns on in green, it will go out.
- Place and adjust the camcorder as necessary. If shooting with the camcorder hand-held, be careful not to obstruct the lens.



2 Press the start/stop button to begin recording.

- You can also touch [●] on the bottom right corner of the screen.
- The ACCESS indicator will flash from time to time while the scene is being recorded.

3 Press the start/stop button again to stop recording.

- You can also touch [■] on the bottom right corner of the screen.

When you have finished recording

Make sure the ACCESS indicator is off and set the power switch to OFF.

■ Changing the Field of View

The camcorder features an ultra wide angle lens so you can capture a vast field of view (about 150° for AVCHD movies, about 160° for MP4 movies, about 170° for photos), for example to include a large group in a fisheye-like image. The ultra wide angle means also that subjects on the sides of the image will appear to have a curved distortion. Alternatively, you can enlarge the center of the screen for a closer view.

Touch [⊕] to enlarge the center of the screen (close-up).
Touch [⊖] to return to the default field of view (ultra wide).

(ultra wide)

(close up)

Switching Between Movies and Photos

With a single touch, you can switch between recording movies ([ ]) and taking photos ([ ]).

To take photos (photo mode), touch [ ].

To record movies (movie mode), touch [ ].

- In order to protect the lens, turn off the camcorder after you have finished recording to keep the lens cover closed.
- Be sure to save your recordings regularly (📖 159), especially after making important recordings. Canon shall not be liable for any loss or corruption of data.

- If a subject is too close to the camcorder, it may not be able to focus correctly. You can set the shooting mode to 🌷 (📖 93) to be able to focus a subject at a distance of only 20 cm from the camcorder.
- If FUNC. ▸ ⚙ ▸ [Auto Power Off] is set to [ON On], the camcorder will shut off automatically to save power when it is powered by a battery pack and is left without any operation for 3 minutes. Should this happen, set the power switch to OFF and then ON again to turn the camcorder back on.
- When recording in bright places, it may be difficult to use the LCD screen. In such cases, you can adjust the LCD backlight with the FUNC. ▸ ⚙ ▸ [LCD Backlight] setting or adjust the brightness of the LCD screen with the FUNC. ▸ ⚙ ▸ [LCD Brightness] setting.

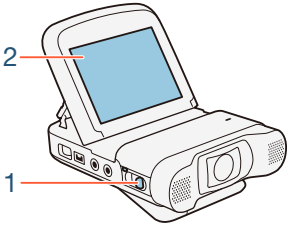
Taking Photos

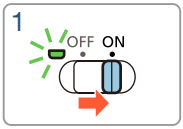
You can easily take photos with the camcorder.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Set the power switch to ON to turn on the camcorder.

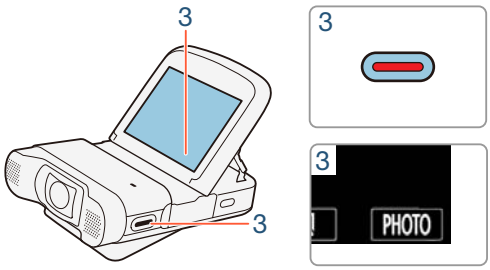
- The lens cover will open.
- After the power/charge indicator turns on in green, it will go out.
- Place and adjust the camcorder as necessary. If shooting with the camcorder hand-held, be careful not to obstruct the lens.





Touch [ ] to switch modes

2 Touch [ ] to switch the camcorder to photo mode (60).



3 Touch [PHOTO] to take a photo.

- You can also press the start/stop button.
- ⊙ will appear on the screen. The screen will turn black momentarily and the aperture value and shutter speed will appear.
- Photos have an aspect ratio of 4:3.

When you have finished taking photos

Make sure the ACCESS indicator is off and set the power switch to OFF.

The information in the ❗ (important precautions) and ⓘ (additional notes) sections in the previous pages apply also to photo shooting.

- Photos cannot be recorded while the camcorder is in movie mode.
- You can use the [FUNC.] > [Photo Size] setting to change the size of the photos you take.
- In order to save power, the image shown on the screen in photo mode is less detailed than the photo that will actually be recorded.
- For details on how many photos you can take, refer to **Reference Tables** (297).

AUTO Mode

With AUTO mode, you can take great-looking videos by letting the camcorder automatically adjust settings.

About the Smart AUTO function

In AUTO mode, the camcorder will automatically detect certain characteristics of the subject, background, lighting conditions, etc.* It will then adjust the exposure and color, selecting the best settings for the scene you want to shoot. The icon in the shooting mode button will automatically change to one of the following Smart AUTO icons.**

* Under certain conditions, the Smart AUTO icon that appears on the screen may not match the actual scene. Especially when shooting against orange or blue backgrounds, the Sunset or one of the Blue Skies icons may appear and the colors may not look natural. In such case, we recommend recording in **P** mode (📖 93).

** There are times when the Smart AUTO function cannot detect the subject, such as during interval recording or when you touch a subject's face for face detection. In such case, AUTO will be displayed as the Smart AUTO icon.

Smart AUTO icons

Subject	Background		
	Bright*	Blue skies*	Vivid colors*
People (stationary)			
People (moving)			
Subjects other than people, such as landscapes			

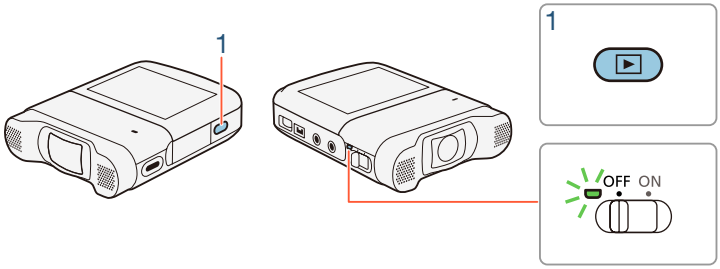
* The icon in parentheses appears under backlight conditions.

Subject	Background		
	Sunset	Dark	Dark + Spotlight
People (stationary)	—		—
People (moving)	—		—
Subjects other than people, such as landscapes			

Basic Playback

Playing Back Video

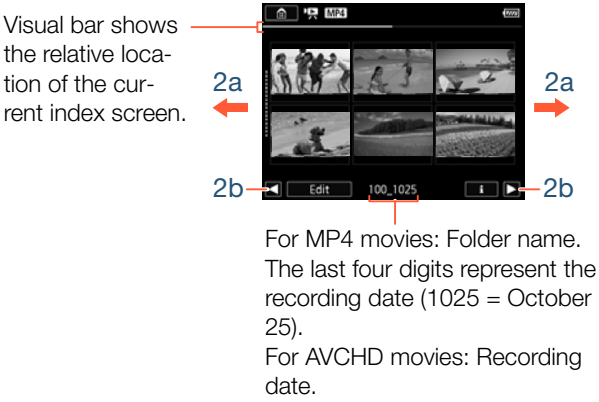
Format: AVCHD MP4 | Shooting mode: AUTO P | Playback



1 Press and hold the ▶ button until an index screen appears.

- The index screen that appears will depend on the recording mode that was used previously. If you were using movie mode, a movie index screen ([MP4], [AVCHD] or [MP4]) will appear; for photo mode, the [ ] index screen will appear.

- To play back AVCHD movies:
  Touch ⌂ ➤ [AVCHD Movie Playback] to open the [AVCHD] index screen.
  To play back MP4 movies:
  Touch ⌂ ➤ [MP4 Movie Playback] to open the [MP4] index screen.
  To play back MP4 video snapshot scenes only:
  Touch ⌂ ➤ [MP4 Video Snapshot] to open the [MP4] index screen.
- After the power/charge indicator turns on in green, it will go out.


Visual bar shows the relative location of the current index screen.
2a
2a
2b
2b
MP4
Edit
100_1025
For MP4 movies: Folder name. The last four digits represent the recording date (1025 = October 25).
For AVCHD movies: Recording date.

2 Look for the scene you want to play back.

- Drag your finger right/left (2a) or touch [◀] or [▶] (2b) to display the previous/next index screen.

3 Touch the desired scene to play it back.

- The camcorder will play back the scene selected and continue until the end of the last scene in the index screen.
- Touch the screen to display the playback controls. During playback, the playback controls will disappear automatically after a few seconds without operation.

To adjust the volume

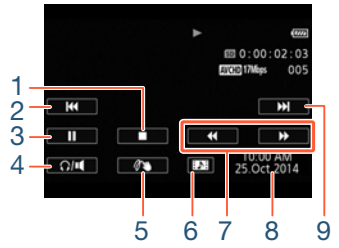
1 During playback, touch the screen to display the playback controls.

2 Touch [🎧/🔊], drag your finger along the [Headphone Volume] or [Speaker Volume] bar, or repeatedly touch the headphone or speaker icon on either end of it to adjust the volume and touch [↩].

Playback controls

For AVCHD movies:

Playback



Playback pause

For MP4 movies:

Playback

Playback pause

1 Stop the playback.

2 Jump to the beginning of the scene. Double-tap to jump to the previous scene.

3 Pause the playback.

4 Volume control.

5 Decoration (109).

6 Capture a video snapshot scene (147).

7 Fast playback* backward/forward.

8 For AVCHD scenes: Recording date and time.
For MP4 scenes: Recording date.

9 Jump to the beginning of the next scene.

10 Resume the playback.

11 Capture the displayed frame as a photo (149).

12 Slow playback** backward/forward.

13 Mirror image playback (MP4 scenes only).

14 Repeat playback (MP4 scenes only).

* Touch several times to increase the playback speed to 5x → 15x → 60x normal speed.

** Touch several times to increase the playback speed to 1/8x → 1/4x normal speed.

The Scene Information Screen

On the scene information screen you can check various details, including the scene's length, date and time of recording and video quality.

1. In the [AVCHD], [MP4] or [MP4] index screen, touch [i] and then touch the desired scene.
   - The [Scene Info] screen appears.
   - Touch [◀]/[▶] to select the previous/next scene.
2. Touch [↩] twice to return to the index screen.

Repeat Playback

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

During playback of the desired scene:

Touch the screen to display the playback controls ❯ [❚❚] ❯ [↻] ❯ [▶]

- The same scene will be played back in a loop. Repeat the procedure to return to normal playback. Stopping the playback will also cancel the repeat playback setting.

Mirror Image Playback

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

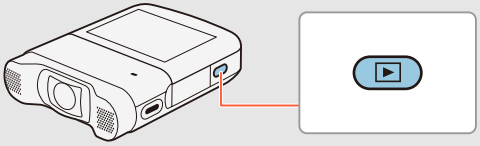
During playback of the desired scene:

Touch the screen to display the playback controls [ ]

- The image will be flipped left to right. Repeat the procedure to end the mirror image playback.

The ▶ button

When the camcorder is turned on, press and hold the ▶ button to switch back and forth between playback and recording mode.



- When the camcorder is off, you can press and hold the ▶ button to turn it on directly in playback mode.
- The ▶ button cannot be used while recording movies (except during interval recording).

- You may not be able to play back with this camcorder movies recorded on or copied onto a memory card using another device.

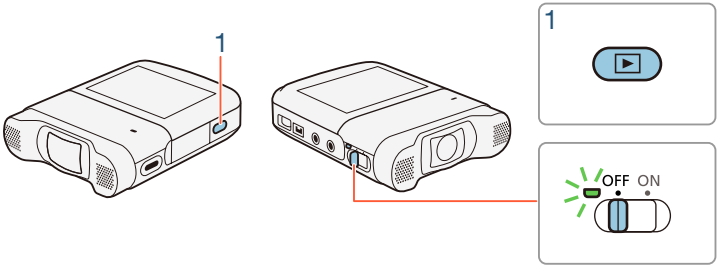
- MP4 video snapshot scenes can be played back from the [MP4] or [MP4] index screen while AVCHD video snapshot scenes can be played back only from the [AVCHD] index screen.
- You can use the > [ ] > [Display Date/Time] setting to choose whether to display the recording date (MP4 movies) or date and time (AVCHD movies) when you play back scenes.
- Depending on the recording conditions, you may notice brief stops in video or sound playback between scenes.
- During fast/slow playback, you may notice some anomalies (blocky video artifacts, banding, etc.) in the playback picture. Also, sound will not be output.
- The speed indicated on the screen is approximate.
- Slow reverse playback will look the same as continuous frame reverse.
- Sound will not be output from the built-in speaker while headphones or the optional HTC-100 High Speed HDMI cable is connected to the camcorder.

Viewing Photos

Format: AVCHD MP4 | Shooting mode: AUTO | Playback

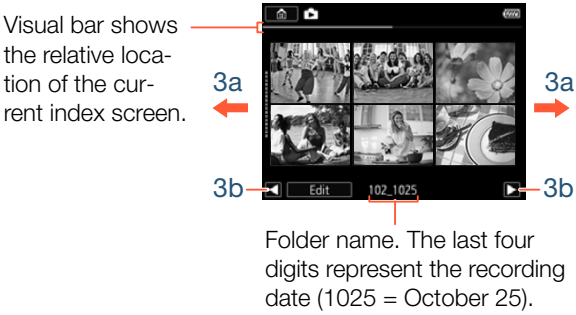
1 Press and hold the ▶ button to turn on the camcorder in playback mode.

- Keep the button held down until the index screen appears.
- After the power/charge indicator turns on in green, it will go out.



2 If a movie index screen appears, open the [📷] index screen.

🏠 ➤ [📷 Photo Playback]



3 Look for the photo you want to view.

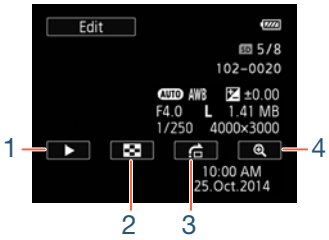
- Drag your finger right/left (3a) or touch [◀] or [▶] (3b) to display the previous/next index screen.

4 Touch the photo you want to view.

- The photo is displayed in single photo view.
- Drag your finger left/right to browse through the photos one by one.
- To return to the [📷] index screen:

Touch the screen to display the playback controls ❯ [▦]

Playback controls



1 Slideshow (86).

2 Return to the [📷] index screen.

3 Photo jump
Touch [◀] or [▶], or drag your finger along the scroll bar to find the desired photo. Touch [↩] to return to single photo view.

4 Magnified playback (see the following section).

Magnifying Photos in Playback

1 In single photo view, select the photo you want to magnify.

2 Magnify the photo.

Touch the screen to display the playback controls ▸ [🔍+]

- The center of the photo is magnified approximately 2 times.
- Touch [🔍+] to magnify the image further. Touch [🔍−] to reduce the magnification.
- Drag your finger along the magnified area to check other parts of the photo. The white square within the frame represents the approximate location of the portion of the photo that is shown magnified.

3 Touch [↩] to cancel the magnified view and return to single photo view.

- You can also touch [🔍−] repeatedly until the magnified view is canceled.

- The following image files may not be displayed correctly with this camcorder if they were recorded on or copied onto a memory card using another device.
  - Images not recorded with this camcorder.
  - Images edited on a computer.
  - Images whose file names have been changed.

Deleting Scenes and Photos

You can delete recordings that you are not interested in keeping. Deleting recordings allows you also to free up space on the memory card.

Deleting Scenes or Photos from the Index Screen

Format: AVCHD MP4 | Shooting mode | Playback

1 Open the index screen that contains the scene or photo you want to delete (📖 67, 75).

- To delete all the scenes or photos recorded on the same date (saved in the same folder), drag your finger left/right until a scene or photo you want to delete appears.

2 Delete the recordings.

[Edit] ➤ [Delete] ➤ Desired option* ➤ [Yes]** ➤ [OK]

* When you select [Select], perform the following procedure to select the individual recordings you want to delete before touching [Yes].

** Touch [Stop] to interrupt the operation while it is in progress. Some recordings may be deleted nevertheless.

To select individual scenes or photos

1 Touch on the individual scenes or photos you want to delete.

- A checkmark ✓ will appear on the scenes or photos you touch. The total number of selected scenes or photos will appear next to the ☑ icon.
- Touch a selected scene or photo to remove the checkmark. To remove all checkmarks at once, touch [Remove All] ❯ [Yes].

2 After selecting all the desired recordings, touch [OK].

Options

[<date>] (for AVCHD movies):
Delete all the scenes recorded on a particular date. The date will appear in the control button.

[<folder name>] (for MP4 movies and photos):
Delete all the scenes or photos recorded on a particular date that are stored in the same folder. The last four digits of the folder name that appears in the button indicate the date the folder was created (ex. 1025 = October 25).

[Select]:
Select individual scenes or photos to delete.

[All Scenes] or [All Photos]:
Delete all the scenes or photos.

Deleting a Single Scene

1 Play back the scene you want to delete (📖 67).

2 Delete the scene.

Touch the screen to display the playback controls ▸ [❚❚] ▸ [Edit] ▸ [Delete] ▸ [Yes] ▸ [OK]

Deleting a Single Photo

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1. In single photo view, select the photo you want to delete (75).
2. Delete the photo.

   Touch the screen to display the playback controls ➤ [Edit] ➤ [Delete] ➤ [🗑 Proceed] ➤ [Yes]

3. Drag your finger left/right to select another photo to delete or touch [✕].

- Be careful when deleting recordings. Once deleted, they cannot be recovered.
- Save copies of important recordings before deleting them (159).
- Photos that were protected with other devices and then transferred to the memory card when it was connected to a computer cannot be deleted with this camcorder.

- To delete all recordings and make all recordable space available again you may prefer to initialize the memory card (📖 43).

Dividing Scenes

You can divide AVCHD scenes in order to leave out the best parts and later cut out the rest.

Format: AVCHD MP4 | Shooting mode | Playback

1. Play back the desired scene (📖 67).
2. At the point where you want to divide the scene, open the screen for dividing scenes.

   Touch the screen to display the playback controls ▸ [❚❚] ▸ [Edit] ▸ [Divide]

3. Bring the scene to a precise point, if necessary.

   Playback controls will appear on the screen (📖 70). Use any special playback modes (fast playback, frame reverse/advance) as necessary to locate the desired point.

4 Divide the scene.

[✂ Divide] ❯ [Yes]

- The video from the division point to the end of the scene will appear as a new scene in the index screen.

- When advancing/reversing frames while dividing the scenes, the interval between frames is about 0.5 seconds.
- If the scene cannot be divided at the point where you paused the playback, advance/reverse a frame and then divide the scene.
- During the playback of a scene that was divided, you may notice some anomalies in the picture/sound at the point where the scene was cut.
- Scenes that are too short (less than 3 seconds) cannot be divided.
- Scenes cannot be divided within 1 second from the beginning or the end of the scene.

Trimming Scenes

You can trim MP4 scenes by removing everything up to a certain point or everything after a certain point. By doing so, you leave only memorable moments to keep for posterity.

Format: AVCHD MP4 | Shooting mode | Playback

1. Play back the scene you want to trim (📖 67).
2. At the point where you want to trim the scene, open the scene trimming screen.

   Touch the screen to display the playback controls ▸ [❚❚] ▸ [Edit] ▸ [Trim]

3. Bring the scene to a precise point, if necessary.
   - The point at which is movie will be trimmed is indicated by the ▼ marker.
   - Playback controls will appear on the screen (📖 70). Use any special playback modes (fast playback, frame reverse/advance) as necessary to locate the desired point.

4 Trim the scene.

[Trim] ❯ [Trim Before Marker] or [Trim After Marker] ❯ [Save as New] or [Overwrite]

- You can select whether to trim the part before or after the marker and whether to save the remaining part of the video as a new scene (keeping the original scene) or to overwrite the original scene.
- Touch [Stop] to interrupt the operation while it is in progress.

- You may not be able to correctly trim scenes that were recorded on or copied onto a memory card using another device.
- Interval scenes with the icon cannot be trimmed.
- Scenes cannot be trimmed within about 0.5 seconds from the beginning or the end of the scene.

Slideshow

You can play a slideshow of all the photos.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1. Open the [📷] index screen (📖 75).
2. Touch the photo that will open the slideshow to display it in single photo view.
3. Start the slideshow.

Touch the screen to display the playback controls ▸ [▶]

- During the photo slideshow, touch the screen and touch [❚❚] to stop the slideshow.

ⓘ
- You can change the slideshow's effects with the MENU ▸ [▶] ▸ [Slideshow Transition] setting.

Advanced Functions

Video Quality and Shooting Modes

90

This section explains how to change the video quality of your recordings and how to use the camcorder's various shooting modes to get perfect recordings when you are shooting fashion scenes, dance training sessions, night scenes or many other special scenes.

Special Recording Modes

97

This section explains how you can use interval recording to create time-lapse scenes, slow and fast motion for unique recordings, or video snapshot scenes for a fast-paced, interesting video clip.

Convenient Functions

108

This section introduces some of the camcorder's functions that you may find convenient in special situations. For example, self timer, fun decorations for your scenes and mirror image recording.

Recording Audio

116 This section explains various functions related to recording audio, such as audio scene selection, wind screen, audio mix and using headphones.

When You Want More Control

139 This section explains functions you can use when you want more control over how your recordings look. It is more oriented for advanced users and covers functions such as white balance and exposure compensation.

Video Quality and Shooting Modes

Selecting the Video Quality

The camcorder offers the following video quality options (bit rates) for recording movies: 24 Mbps, 17 Mbps and 4 Mbps[1]. Select 24 Mbps for higher video quality; select 4 Mbps for longer recording times or smaller file sizes. In addition, for AVCHD movies, when the video quality is set to 24 Mbps, you can enjoy two-channel linear PCM (LPCM) audio recording with a sampling frequency of 48 kHz[2].

[1] The 4 Mbps option is available for MP4 movies only.

[2] With LPCM audio recording, recorded data is not processed or compressed so there is no loss of audio quality. When scenes recorded at 24 Mbps are played back on other devices, audio will be output only if the device is compatible with LPCM audio.

[Other Settings] > [Video Quality] > Desired video quality > [✕]

- For details on approximate recording times, refer to **Approximate recording times** (297).
- Bit rate (measured in Mbps) indicates how much information is recorded in 1 second of video and therefore affects also the recording time available on the memory card.
- Depending on the device used, you may not be able to play back your recordings on other devices.
- The camcorder uses a variable bit rate (VBR) to encode video so the actual recording times will vary depending on the content of the scenes.
- The following types of MP4 scenes will be recognized as multiple files on other devices.
  - Scenes exceeding 4 GB.
  - Scenes exceeding 1 hour.

Selecting the Photo Size

Photos are recorded as JPG files. The camcorder offers three photo sizes but the photo quality cannot be changed. As a general rule, select a larger photo size for higher quality.

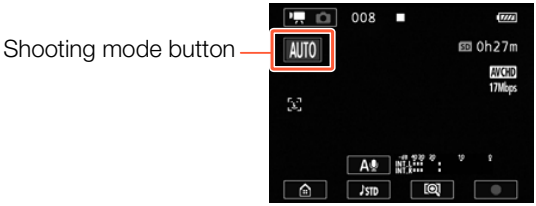
1. Set the camcorder to photo mode (60).
2. Select the photo size.

HOME ▸ [Other Settings] ▸ [Camera] ▸ [Photo Size] ▸ Desired option ▸ [×]

- Even if the photo size was set to **L**, it will change automatically to **M** size when you set the field of view to close-up.
- For details on the number of photos you can take on a memory card, refer to **Approximate number of photos available on a 4 GB memory card** (297).

Selecting the Shooting Mode

In addition to AUTO mode, the camcorder features a number of shooting modes that offer the most appropriate settings for a variety of special scenes. You can also use the P shooting mode when you want the camcorder to set the exposure automatically but control manually some advanced settings.



1 Touch the shooting mode button on the top left corner of the screen.

- The button will show the icon of the shooting mode currently selected. If the camcorder is set to AUTO mode, the button will show one of the Smart AUTO icons (66).
- Alternatively, you can open the shooting mode selection screen from the (Home) menu: (Home) > [Shooting Mode].

2 Drag your finger up/down to bring the desired shooting mode to the center and then touch [OK].

- You can also touch the icon in the center instead of touching [OK].

Options (♦ Default value; SCN - special scene shooting mode)

[Macro] (SCN)

The camcorder can focus at a shorter distance, allowing you to get closer shots of flowers or insects. When the field of view is ultra wide (📖 59) subjects will also stand out more because of the fisheye effect of the ultra wide angle lens.

[AUTO Auto]♦

Let the camcorder take care of most of the settings while you concentrate on recording (📖 57). Great for beginners or if you just prefer not to bother with detailed camcorder settings.

[Food and Fashion] (SCN)

To record fashion or food related scenes with vivid colors.

[Sports] (**SCN**)
To record scenes with lots of movement, such as sport events and dance scenes.

[Night Scene] (**SCN**)
To record nightscapes with lower noise.

[Beach] (**SCN**)
To record on a sunny beach without the subject being underexposed.

[Snow] (**SCN**)
To record in bright ski resorts without the subject being underexposed.

[Car] (**SCN**)
To record in a car without the subject being underexposed.

[**P** Programmed AE]

The camcorder automatically sets the shutter speed and aperture but you have the option to adjust the white balance (📖 139) and exposure (📖 141).

- [Sports]/[Beach]/[Snow]: The picture may not appear smooth during playback.
- [Beach]/[Snow]: The subject may become overexposed on cloudy days or in shaded places. Check the image on the screen.
- [Macro]: The camcorder can focus on a subject as close as 21 cm.

Special Recording Modes

Interval Recording

When the movie format is set to MP4, you can easily set the camcorder to record about half a second of video or a photo at fixed intervals from 5 seconds to 10 minutes. When recording video using interval recording, you can join all these short bits of video (interval scenes) into a single time-lapse scene that captures the passage of time.
Sound is not recorded in this special recording mode.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Make sure the camcorder has sufficient power to complete the operation.

- Insert a fully charged battery pack or use the supplied compact power adapter.

2 Activate interval recording.

[Special Rec Modes] > [Interval Recording] > [OK]

- You can also touch the icon in the center instead of touching [OK].

- The default recording interval is 5 seconds. Before touching [OK], you can change the recording interval with the following procedure (99).

3 Touch [OK] and start recording with interval recording.

- and the selected interval length will appear on the screen. Also, the remaining video recording time will automatically be reduced by about half.
- In movie mode: Press the start/stop button or touch [●] to record the first video.
  In photo mode: Press the start/stop button or touch [PHOTO].
- The camcorder will continue recording interval scenes or photos at the set interval. The number of videos/photos recorded so far, and a countdown until the next recording is made will be displayed on the screen.
- You can change the recording interval with the following procedure.

4 Press and hold the ▶ button and then touch [Yes] to end interval recording mode.

- Interval recording mode will end. In photo mode, the rest of the procedure is not necessary.
- In movie mode, continue the procedure to join all the interval scenes into a single time-lapse scene.

5 Touch [Yes] to join the interval scenes.

- If you prefer to join the interval scenes later on, touch [No] instead. The rest of the procedure is not necessary.
- You can touch [Stop] ▸ [OK] to interrupt the operation while it is in progress. The index screen will appear, displaying the folder where the interval scenes are saved.

6 Touch [OK].

7 Touch [Yes] to delete the original interval scenes.

- If you prefer to keep the original interval scenes even after they were successfully joined, touch [No] instead.
- You can touch [Stop] to interrupt the operation while it is in progress.

8 Touch [OK].

- A new time-lapse scene, created from all the interval scenes, will be added to the [ ] index screen.

To change the recording interval

You can change the recording interval while activating interval recording (from the [Interval Recording] selection screen) or from the record standby screen after interval recording is activated.

[ ] ▸ Desired interval ▸ [ ]

To join interval scenes later on

Even if you did not join MP4 scenes recorded using interval recording immediately after recording them, you can do so at a later date.

1. Open the [MP4] index screen (📖 67).
2. Touch an interval scene marked with the icon.
3. Touch [Join] and continue from step 5 in the previous procedure (📖 99).

- Face detection and tracking, exposure adjustment and Wi-Fi functions cannot be used during interval recording.
- The maximum recording time from the point recording begins to the point it ends is as follows. The maximum recording time in interval recording mode depends on the selected recording interval.

Recording interval	Maximum recording time*
5 sec., 10 sec., 30 sec.	3 hours
1 min.	6 hours
10 min.	60 hours

* When the camcorder is being powered by a battery pack, depending on the remaining battery charge, the maximum recording time may be shorter.

- Depending on the memory card used, writing on the memory card may take longer, and the actual recording interval may be longer than the recording interval that was selected.
- When you select a recording interval of 30 seconds or longer, the camcorder will enter standby mode when it is not recording in order to save power. In standby mode the screen will turn off and the power/charge indicator will light up in green.

Slow and Fast Motion

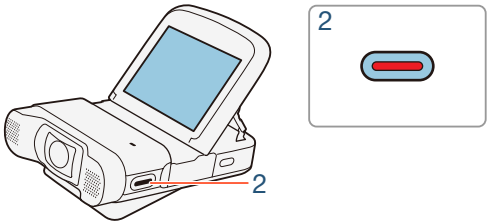
When the movie format is set to MP4, you can use slow motion or fast motion to record movies with a unique look. Sound is not recorded in this special recording mode.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Activate slow/fast motion.

[Special Rec Modes] > [Slow Motion] or [Fast Motion] > [OK]

- You can also touch the icon in the center instead of touching [OK].
- Before touching [OK], you can change the playback speed with the following procedure.
- or and the selected speed will appear on the screen.



2 Press the start/stop button to record scenes in slow/fast motion.

- You can also touch [●]/[■].

To change the playback speed

You can change the playback speed while activating slow/fast motion (from the [Slow Motion]/[Fast Motion] selection screen) or from the record standby screen after slow/fast motion is activated.

[ ] ❯ Desired speed ❯ [ ]

- The maximum continuous recording time using slow motion is 6 hours ([x1/2] speed) or 3 hours ([x1/4] speed). After that, recording will continue as a separate scene.
- When recording using slow motion, the video quality will change automatically to 4 Mbps/1280x720 ([x1/2] speed) or 3 Mbps/640x360 ([x1/4] speed).

Video Snapshot

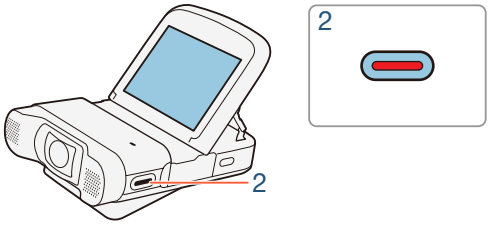
You can record a series of short scenes, each a few seconds long. When you play the video snapshot scenes one after the other, this will result in fast-paced, dynamic video.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Activate video snapshot.

[Home] > [Special Rec Modes] > [Video Snapshot] > [OK]

- You can also touch the icon in the center instead of touching [OK].
- and the video snapshot length currently selected, and a blue border appear on the screen.



2 Press the start/stop button.

- You can also touch [●].
- The camcorder records for about 4 seconds (the blue frame serves as a visual progress bar) and then automatically returns to record standby mode.

- You can change the length of the video snapshot scenes recorded to 2 or 8 seconds with the [Video Snapshot Length] setting.
- Changing the movie format will deactivate video snapshot.

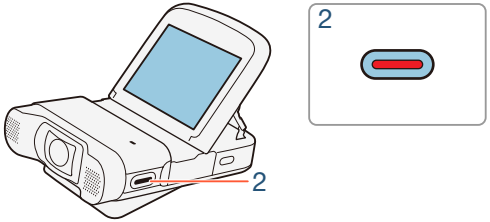
Pre-Recording

The camcorder will start recording 3 seconds before you press the start/stop button, ensuring you do not miss important shooting opportunities. This is especially useful when it is difficult to predict when to start recording.

1 Activate the pre-recording function.

[Special Rec Modes] > [Pre REC] > [OK]

- You can also touch the icon in the center instead of touching [OK].
- will appear on the screen.



2 Press the start/stop button.

- You can also touch [●].
- The scene recorded in the memory will start 3 seconds before the start/stop button was pressed.

- The camcorder will not record the full 3 seconds prior to pressing the start/stop button if the button was pressed within 3 seconds of having turned on pre-recording or having finished the previous recording.

- When the movie format is AVCHD and you activate the pre-recording function, the time code will start running.

Convenient Functions

Self Timer

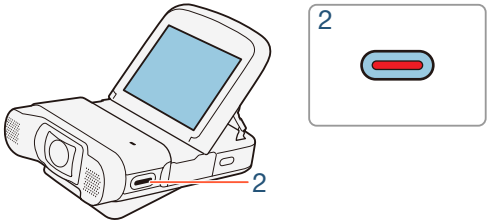
By setting the self-timer, you will be able to include yourself in the shot before the camcorder starts recording a movie or taking a photo.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Activate the self-timer function.

[Self Timer] [2sec 2 sec] or [10sec 10 sec] [✕]

- or will appear on the screen.



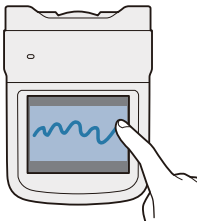
2 In record standby mode, press the start/stop button.

- You can also touch [●] for movies or [PHOTO] for photos.
- The countdown appears on the screen.

- Once the countdown has begun, any of the following actions will cancel the self timer.
  - Pressing the start/stop button.
  - Touching [●] when recording movies.
  - Turning off the camcorder.
  - Pressing and holding the ▶ button.

Decoration: Adding a Personal Touch

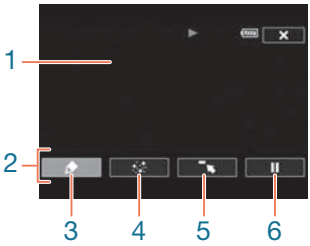
Add a new level of enjoyment while playing back your scenes by decorating them. You can add animated graphics, stamps and even your own freehand drawing easily just by simply using your fingertip.



Format: AVCHD MP4 | Shooting mode | Playback

Decorating Scenes

1. Play back the scene you want to decorate (67).
2. Touch the screen to display the playback controls.
3. Touch [✋] to display the decoration toolbar.
   - You can touch [❚❚] to pause the playback. During playback pause mode, you can save a canvas or load a previously saved canvas (111).
4. Use a tool from the toolbar as explained in the following procedures.
5. Touch [✕] to exit the decoration screen.



1 Canvas - The area where you will draw and see your decorations in action.

2 Toolbar.

3 [Pens and Stamps] Select the type of pen or stamp and its color. You can also save a single canvas or load a previously saved canvas.

4 [Animated Stamps] Select animated stamps to add to your decoration.

5 [ ] Minimize the toolbar to the top of the screen to view almost all of the canvas. Touch [ ] to restore the toolbar.

6 [❚❚]/[▶] Pause the playback or resume it after it has been paused.

To Use [Pens and Stamps]

1 Touch [ ].

- The [Pens and Stamps] screen will appear.

2 Touch the desired pen or stamp from [Tools].

- The main decoration screen will appear again.

3 Draw freely on the canvas with your fingertip.

- To select a different pen or stamp: Repeat steps 1 and 2.
- To change color: Touch [ ] and then touch the white or black button under [Colors]. Alternatively, touch [ ] ❯ [ ] and select a color from the color palette.
- To clear your freehand drawings and stamps: Touch [ ] ❯ [Clear] ❯ [Yes] ❯ [ ].

- To save your freehand drawings and stamps on the memory card: Touch [✎] ⟩⟩ [SD Save] ⟩⟩ [Yes] ⟩⟩ [↩].
- To load a previously saved canvas (freehand drawings and stamps only) from the memory card: Touch [✎] ⟩⟩ [SD Load] ⟩⟩ [Yes] ⟩⟩ [↩].
- You will need to pause the playback before saving or loading a canvas.

To Use [Animated Stamps]

1. Touch [✦].
   - The [Animated Stamps] screen will appear.
2. Touch one of the buttons.
3. Touch anywhere on the canvas to place the selected animated stamp. You can also drag some animated stamps to a different location.

Image Rotation and Image Flipping

For MP4 movies and photos, the camcorder offers two functions to manipulate how the image is recorded or played back. Using mirror image recording, the camcorder will record the image reversing left and right. When orientation detection is turned on, the camcorder will detect if it is turned sideways or upside-down while recording so the image can be corrected during playback.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

[Flip/Rotate Image] > [Mirror Image] or [Detect Orientation] > [On] > [×]

- The icon of the selected function will appear on the screen.

Example of image flipping

[Mirror Image] set to [Off]

[Mirror Image] set to [On]

Examples of image rotation when [Detect Orientation] is set to [On]

Recording		Playback	
Camcorder's orientation*	Onscreen icon	Movies**	Photos***

* As seen from the back of the camcorder, with the lens pointing forward.

** Even when orientation detection is turned on, movies recorded with the camcorder turned sideways cannot be played back in vertical orientation using the camcorder.

***To display photos in the correct orientation, orientation detection should be turned on while recording and [Auto Rotate] should be set to [ON On] during playback.

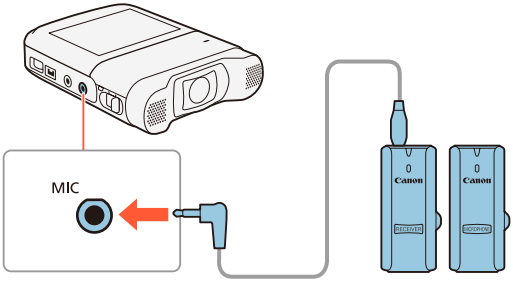
Recording Audio

You can record audio using the built-in stereo microphone or an external microphone connected to the MIC terminal. When you are recording AVCHD movies and the video quality is set to 24 Mbps, you can enjoy two-channel linear PCM audio recording with a sampling frequency of 48 kHz.
Audio is not recorded during interval recording and slow/fast motion.

Using an External Microphone

■ Using the WM-V1 Wireless Microphone

Using the optional WM-V1 Wireless Microphone, you can reliably record sound even when recording subjects at a distance exceeding the practical range of the built-in microphone. For details on connecting and using the WM-V1, refer to the instruction manual supplied with the microphone.



Using Commercially Available Microphones

You can also use commercially available condenser microphones with their own power supply. You can connect almost any stereo microphone with a ∅ 3.5 mm plug and a cable no longer than 3 m but audio recording levels may vary.

Connect the external microphone to the MIC terminal.

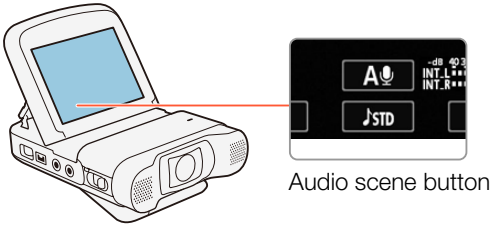
- An external microphone may pick up noise while Wi-Fi functions are in use. Keep a distance between the camcorder and microphone.

- When referring to the instruction manual of the WM-V1, note that the procedure written for manually adjusting the audio recording level does not apply to this camcorder. Refer to **Audio Recording Level** (124) for this camcorder's correct procedure.

Audio Scenes (Built-in Microphone)

You can have the camcorder optimize the audio settings of the built-in microphone by selecting the audio scene that matches your surroundings. This will greatly enhance the sense of “being there”.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback



Audio scene button

Touch the audio scene button ❯ Desired audio scene ❯ [OK]

- You can also touch the icon in the center instead of touching [OK].
- Alternatively, you can touch ⌂ ❯ [Audio Scene] to open the audio scene menu.

Options (♦ Default value)

[STD Standard]♦
To record most general situations. The camcorder records with standard settings.

[Music]
To vibrantly record music performances and singing indoors.

[Festival]
Optimized for recording music outdoors more naturally. Ideal for outdoor events with music.

[Speech]
Best for recording human voices and dialog.

[Meeting]
To record people talking while keeping each voice separate, allowing viewers to feel as if they were there.

[Forest and Birds]
To record birds and scenes in forests. The camcorder clearly captures sound as it spreads.

[Noise Suppression]
To record scenes while reducing noise from wind, passing vehicles and similar ambient sound. Ideal for recording at the beach or in places with a lot of noise.

[Custom Setting]
Allows you to adjust the audio settings to your liking. You can adjust the following settings in the menu: [Built-in Mic Wind Screen], [Built-in Mic Att.], [Built-in Mic Freq. Response], [Built-in Mic Directionality], [Audio Limiter] and [Audio Compressor].

Settings for each audio scene

	[STD Standard]	[Music]	[Festival]	[Speech]
Audio recording level	[M Manual]: 70	[M Manual]: 70	[M Manual]: 70	[M Manual]: 86
[Built-in Mic Wind Screen]	[**H** Auto (High)]	[**L** Auto (Low) Low]	[**L** Auto (Low) Low]	[**H** Auto (High)]
[Built-in Mic Att.]	[**A** Automatic]	[**A** Automatic]	[**A** Automatic]	[**A** Automatic]
[Built-in Mic Freq. Response]	[NORM Normal]	[LHB Boost HF+LF Range]	[NORM Normal]	[MB Boost MF Range]
[Built-in Mic Directionality]	[NORM Normal]	[2ch WIDE Wide]	[2ch WIDE Wide]	[2ch MONO Monaural]
[Audio Limiter]	[**ON** On]	[**ON** On]	[**ON** On]	[**ON** On]
[Audio Compressor]	[**L** Low]	[**L** Low]	[**L** Low]	[**OFF** Off]

	[Meeting]	[Forests and Birds]	[Noise Suppression]	[Custom Setting]
Audio recording level	[M Manual]: 94	[M Manual]: 80	[M Manual]: 70	Selected by user (124)
[Built-in Mic Wind Screen]	[**H** Auto (High)]	[**H** Auto (High)]	[**H** Auto (High)]	Selected by user (126)
[Built-in Mic Att.]	[**A** Automatic]	[**A** Automatic]	[**A** Automatic]	Selected by user (127)
[Built-in Mic Freq. Response]	[**MB** Boost MF Range]	[**LC** Low Cut Filter]	[**LC** Low Cut Filter]	Selected by user (129)
[Built-in Mic Directionality]	[2ch WIDE Wide]	[2ch WIDE Wide]	[2ch MONO Monaural]	Selected by user (130)
[Audio Limiter]	[**ON** On]	[**ON** On]	[**ON** On]	Selected by user (135)
[Audio Compressor]	[**H** High]	[**L** Low]	[**OFF** Off]	Selected by user (135)

- [♪C Custom Setting] is not available in AUTO mode. After setting [Audio Scene] to [♪C Custom Setting], if the camcorder is then set to AUTO mode, this setting will change to [♪STD Standard].
- To reproduce louder and quieter sounds in music more faithfully, we recommend that you first adjust the audio recording level (refer to the following section). To reproduce the linearity of the music even more faithfully, we recommend that you select the [♪C Custom Setting] audio scene and adjust the audio settings to match those of the [♪ Music] audio scene except set [Audio Compressor] to [OFF Off].

Audio Recording Level

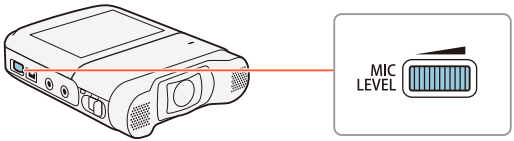
You can adjust the audio recording level of the built-in microphone or an external microphone connected to the MIC terminal.

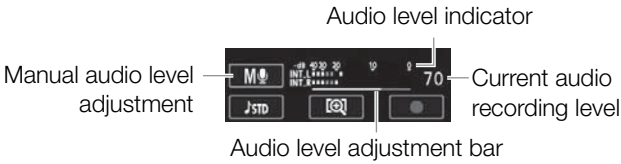
Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Set the audio recording level to manual.

[A] ▸ [M Manual] ▸ [↩]

- The current audio recording level will appear next to the audio level indicator.
- Touch [A Automatic] instead to return the camcorder to automatic audio recording level.





2 Turn the MIC LEVEL dial to adjust the audio recording level as necessary.

- As a guideline, adjust the audio recording level so that the audio level meter will go to the right of the -10 dB mark only occasionally.

- When the audio level meter reaches the red point (0 dB), the sound may be distorted.
- We recommend using headphones to check the sound level while adjusting the audio recording level or when the microphone attenuator is activated.

Wind Screen (Built-in Microphone)

The camcorder automatically reduces the background sound of wind when recording outdoors. You can select from two levels or turn off the auto wind screen.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1. Make sure [Audio Scene] is set to [♪c Custom Setting] (118).
2. Activate the wind screen.

[Other Settings] > [Built-in Mic Wind Screen] > Desired option > [✕]

Options (♦ Default value)

[H Auto (High)]♦
The camcorder will reduce a large amount of noise from the wind. Low-frequency sounds will also be reduced.

[L Auto (Low)]
The camcorder will reduce a small amount of noise from the wind. A small amount of low-frequency sounds will also be reduced.

[OFF Off] The built-in microphone's wind screen will be deactivated at all times.

- Some low-frequency sounds will be suppressed along with the sound of wind. When recording in surroundings unaffected by wind or if you want to record low-frequency sounds, we recommend setting [Built-in Mic Wind Screen] to [OFF Off].

Microphone Attenuator (Built-in Microphone)

You can activate the microphone attenuator (20 dB) for the built-in microphone to prevent audio from being distorted if the audio level is too high.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Make sure [Audio Scene] is set to [♪c Custom Setting] (📖 118).

2 Activate the microphone attenuator.

[Other Settings] [Built-in Mic Att.] Desired option [✕]

Options (♦ Default value)

[A Automatic]♦

The camcorder will automatically activate the built-in microphone attenuator as necessary for optimal audio recording levels so high audio levels will not be distorted.

[ON On]

The built-in microphone attenuator will be activated at all times to reproduce more faithfully the sound dynamics. When you select this option, ATT will appear on the screen.

[OFF Off]

The built-in microphone attenuator will be deactivated at all times. When you select this option, A OFF will appear on the screen.

Audio Equalizer (Built-in Microphone)

You can use the audio equalizer to adjust sound levels by specifically targeting one of the available frequency ranges.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1. Make sure [Audio Scene] is set to [♪c Custom Setting] (118).
2. Adjust the audio equalizer.

> [Other Settings] ➤ [Built-in Mic Freq. Response] ➤ Desired option ➤ [✕]

Options (♦ Default value)

[NORM Normal]♦
Appropriate for balanced sound under most normal recording conditions.

[LB Boost LF Range]
Accentuates the low-frequency range for more powerful sound.

[LC Low Cut Filter]
Filters the low-frequency range to reduce the noise of blowing wind, a car's engine and similar ambient sounds.

[MB Boost MF Range]
Best for recording human voices and dialog.

[LHB Boost HF+LF Range]
Best, for example, for recording live music and clearly capture the special sound characteristics of a variety of instruments.

Microphone Directionality (Built-in Microphone)

You can change the directionality of the built-in microphone to have more control over how sound is recorded.

Format: AVCHD MP4 | Shooting mode | Playback

1. Make sure [Audio Scene] is set to [♪c Custom Setting] (📖 118).
2. Adjust the microphone directionality.

⌂ ➤ [Other Settings] ➤ [🎙] ➤ [Built-in Mic Directionality] ➤ Desired option ➤ [✕]

Options (♦ Default value)

[2ch MONO Monaural]
Mono recording that emphasizes sound coming from the front of the camcorder/microphone.

[NORM Normal]♦
Standard stereo recording; a middle point between the [2ch WIDE Wide] and [2ch MONO Monaural] settings in reach.

[2ch WIDE Wide]
Stereo recording of ambient sound over a more extensive area that adds to the sense of presence of movies.

Microphone Attenuator (External Microphone)

You can activate the microphone attenuator (20 dB) for a microphone connected to the MIC terminal to prevent audio from being distorted if the audio level is too high.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

⌂ ▸ [Other Settings] ▸ [MIC] ▸ [MIC Att.] ▸ Desired option ▸ [✕]

Options (♦ Default value)

[A Automatic]♦

The camcorder will automatically activate the microphone attenuator as necessary for optimal audio recording levels so high audio levels will not be distorted.

[ON On]

The microphone attenuator will be activated at all times to reproduce more faithfully the sound dynamics. When you select this option, ATT will appear on the screen.

[OFF Off]

The microphone attenuator will be deactivated at all times. When you select this option, A OFF will appear on the screen.

Low Cut Filter (External Microphone)

When you are recording using a microphone connected to the MIC terminal, you can activate the low cut filter to reduce the sound of blowing wind, a car's engine and similar ambient sounds.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

[Other Settings] > [MIC Low Cut] > [ON On] > [✕]

Switching the Input (External Microphone)

You can switch the input of the MIC terminal depending on whether you are using an external microphone or an external audio source, such as a digital audio player. However, this procedure is not necessary for the optional WM-V1 Wireless Microphone.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

[Other Settings] > [MIC Terminal Input] > [LINE External Audio] or [MIC Microphone] > [✕]

Audio Mix

When recording, you can mix audio from the built-in microphone with external audio from the MIC terminal and adjust the mix balance for original sound effects. The external audio input can be from the optional WM-V1 Wireless Microphone, a commercially available external microphone or from an external audio player (analog Line In).

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1. Connect the external source to the MIC terminal.
2. Activate the audio mix.

   [Home] ▸ [Other Settings] ▸ [Mic] ▸ [Audio Mix] ▸ [ON On]

   - The audio level indicator and audio mix bar will appear.
3. Adjust the audio mix balance as necessary.
   - Touch [INT] (more of the sound from the built-in microphone) or [LINE]/[MIC] (more of the sound from the external audio) or drag your finger along the audio mix bar to adjust the mix balance as desired.
4. Touch [✕] to set the audio mix and close the menu.

Audio Limiter

The audio limiter will limit the amplitude of audio signals to prevent audio distortions when sudden, loud sounds are picked up by the camcorder.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1. Make sure [Audio Scene] is set to [♪c Custom Setting] (118) and the audio recording level is set to [M Manual] (124).
2. Activate the audio limiter.

> [Other Settings] > [Audio Limiter] > [ON On] > [×]

Audio Compressor

The audio compressor will adjust the audio levels while maintaining the strength of even louder sounds, which will make listening to the audio easier.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

1 Make sure [Audio Scene] is set to [♪c Custom Setting] (📖 118).

2 Activate the audio compressor.

🏠 ➤ [Other Settings] ➤ [🎙] ➤ [Audio Compressor] ➤ Desired option ➤ [✕]

Options (♦ Default value)

[**H** High]

Flattens out audio levels more and is best when recording multiple people talking at varying levels, such as during a meeting.

[L Low]♦

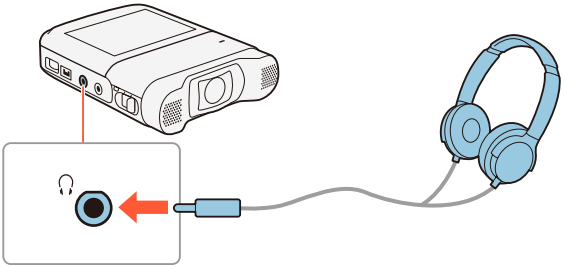
Keeps the difference between higher and lower audio levels clear and is best when recording situations such as a musical performance. This setting is effective when the audio level meter goes all the way to the right repeatedly.

[OFF Off]

To record scenes that are not mainly people talking or music performances.

Using Headphones

Use headphones for playback or to check the audio level while recording. Connect headphones to the 🎧 terminal. When using headphones, make sure to lower the volume to an appropriate level.



Adjusting the Volume from the Menus

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

[Other Settings] ▸ [ ] ▸ [Headphone Volume] ▸ [🎧›] or [🎧)))]* to adjust the volume ▸ [✕]

* You can also drag your finger along the volume bar.

- The volume will be output at the selected level.

Adjusting the Volume during Playback

Format: AVCHD MP4 | Shooting mode | Playback

In playback mode, adjust the headphones volume the same way you would adjust the speaker's volume (69), selecting the headphone icons instead.

- Use commercially available headphones with a ∅ 3.5 mm minijack and a cable no longer than 3 m.
- Audio will not output from the (headphones) terminal while Wi-Fi functions are in use.

When You Want More Control

White Balance

The white balance function helps you to accurately reproduce colors under different lighting conditions so that white objects will always look truly white in your recordings.

Format: AVCHD MP4 | Shooting mode: P | Playback

1. Select the [P Programmed AE] shooting mode (93), but do not touch [OK].
2. Touch [WB] to open the white balance selection screen.
3. Select the desired white balance option.
   - When you select [Custom WB], set the custom white balance with the following procedure.
4. Touch [✕] to set the shooting mode to P and apply the selected white balance.
   - The icon of the selected white balance setting will appear on the screen.

To set the custom white balance

1. Point the camcorder at a white object, so it fills the frame at the center of the screen.
2. Touch [Set WB].

   When the adjustment is completed, stops flashing and disappears. The camcorder will retain the custom white balance even if you turn it off.
3. Touch [↩].

Options (♦ Default value)

[AWB Automatic]♦
The camcorder automatically sets the white balance for natural looking colors.

[☀ Daylight]
To record outdoors.

[☀ Tungsten]
To record under tungsten and tungsten-type 3-wavelength fluorescent lighting.

[Custom WB]
Use the custom white balance setting to make white subjects appear white under colored lighting.

- **When you select the custom white balance:**
  - Reset the white balance when you change locations or the lighting or other conditions change.
  - Depending on the light source, may keep flashing. The result will still be better than with [AWB Automatic].
- Custom white balance may provide better results in the following cases.
  - Changing lighting conditions.
  - Close-ups.
  - Subjects in a single color (sky, sea or forest).
  - Under mercury lamps, certain types of fluorescent lights and LED lights.

Exposure

When you want to record a subject that is much brighter or darker than its surroundings, the automatic exposure obtained by the camcorder may not be best for that specific subject. To correct this, you can compensate the exposure to make the whole picture brighter or darker, you can use Touch AE to tell the camcorder to optimize the exposure for a selected subject, or you can use a combination of both.

Format: AVCHD MP4 | Shooting mode | Playback

1 Select the desired shooting mode (93), but do not touch [OK].

2 Touch [+/-] to open the exposure adjustment screen.

Exposure Compensation

1 Touch [**M**].

- The exposure is locked and the exposure compensation dial appears with the compensation value set at ±0.
- Touch [**M**] again to return the camcorder to automatic exposure.

2 Touch [◀] or [▶], or drag your finger along the dial to compensate the exposure.

- + values will make the picture brighter; – values will make it darker.
- The compensation range may vary depending on the initial brightness of the image, and some values may be grayed out.

3 Touch [✕] to apply the selected shooting mode and exposure compensation value.

- During exposure lock, ± and the exposure compensation value will appear on the screen.

■ Touch AE

1 Touch a subject that appears inside the ± frame.

- The Touch AE mark (⁘) will flash and the exposure will be optimized automatically for the subject you selected.
- Touch [**M**] to return the camcorder to automatic exposure.

2 Touch [✕] to apply the selected shooting mode and adjusted exposure.

- Using Touch AE also locks the exposure (the exposure compensation dial appears with the compensation value set at ±0). Before touching [✕], you can compensate the exposure further (steps 2 and 3 in the previous procedure).
- During exposure lock, ± and the exposure compensation value will appear on the screen.

- If the shooting mode is changed during exposure compensation, the camcorder will return to automatic exposure.
- This function is not available during interval recording.

Face Detection

The camcorder automatically detects people's faces and uses this information to set the correct exposure.

Format: AVCHD MP4 | Shooting mode: AUTO P | Playback

* Face detection is always activated in AUTO mode.

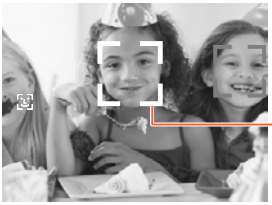
By default, face detection is activated so you can skip step 1 in the following procedure. If the function was turned off, perform the following procedure starting from step 1.

1 Activate face detection.

[Other Settings] ▸ [/] ▸ [Face Detection & Tracking] ▸ [ON On] ▸ [✕]

2 Point the camcorder at a person.

- If there is more than one person in the picture, the camcorder will automatically select one person it determines is the main subject. The main subject is indicated by a white frame and the camcorder will optimize the settings for that person. Other faces will have gray frames.



3 Touch a different face on the touch screen to optimize the exposure for another person.

- A white double frame will appear around the selected person's face.
- Touch [Cancel] to remove the frame.

- The camcorder may mistakenly detect the faces of non-human subjects. In such case, turn face detection off.
- In certain cases, faces may not be detected correctly. Typical examples include:
  - Faces extremely small, large, dark or bright in relation to the overall picture.
  - Faces turned to the side, at a diagonal or partially hidden.
- Face detection is not available in the following cases.
  - While recording using interval recording or slow/fast motion.
  - While the camcorder is controlled remotely from an iOS/Android device.
  - When the exposure was adjusted manually.

Capturing Video Snapshot Scenes and Photos from a Movie

You can capture video snapshot scenes or photos from a previously recorded scene. For example, you may want to print photos from video recorded at a party or create a small video clip using video snapshot scenes from the highlights of an event.

Format: AVCHD MP4 | Shooting mode | Playback

■ Capturing a Video Snapshot Scene

1. Play back the scene from which you want to capture the video snapshot scene (📖 67).
2. At the point where you want the video snapshot scene to start, touch the screen to display the playback controls.
3. Touch [ ].
   - You can also press the start/stop button.
   - The camcorder captures the video snapshot scene for about 4 seconds (the blue frame serves as a visual progress bar), and then enters playback pause mode.

4 Touch [■] to stop the playback.

- The new video snapshot scene will have the same recording date (for AVCHD movies) or be saved in the same folder (for MP4 movies) as the original scene.

- You can change the length of the video snapshot scenes you capture to 2 or 8 seconds with the [Video Snapshot Length] setting.
- A video snapshot scene can be captured only during playback; it cannot be captured during playback pause mode.
- Video snapshot scenes cannot be captured from scenes shorter than 1 second.
- When you start capturing a video snapshot scene less than 1 second from the end of the scene, the video snapshot scene will be captured starting from the beginning of the following scene.

Capturing Photos

1. Play back the scene from which you want to capture the photo (📖 67).
2. At the point you want to capture, pause the playback and capture the photo.

   Touch the screen to display the playback controls ❯ [❚❚] ❯ [PHOTO]

3. Touch [■] to stop the playback.

- The size of photos captured from a scene is 1920x1080 (16:9 aspect ratio).
- The data code of the photos will reflect the date and time of recording of the original scene.
- Photos captured from a scene with a lot of fast movement may be blurred.

External Connections

Terminals on the Camcorder

151 This section gives more details about the camcorder's output terminals and presents connection diagrams for connecting your camcorder to other devices.

Playback on a TV Screen

154 This section explains how to connect the camcorder to an HDTV using the optional HTC-100 High Speed HDMI Cable.

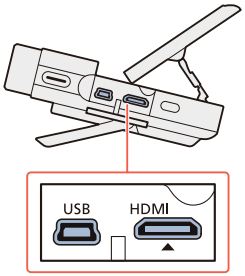
Saving and Sharing Your Recordings

156 Finally, this section explains how to convert movies to smaller video files and how to upload movies and photos to a computer using the supplied USB cable.

* Note that this chapter presents only connections to other devices using cables (wired connections). To use the camcorder's convenient wireless connections, refer to **Wi-Fi Functions** (📖 170).

Terminals on the Camcorder

Open the side terminal cover to access the terminals on the camcorder.



1 **HDMI Terminal**

The HDMI terminal offers a high-quality digital connection that combines audio and video in a single convenient cable. This terminal is an HDMI mini receptacle. When using a commercially available HDMI cable, make sure the HDMI cable is Type A to Type C and is no longer than 3 meters.

2 **USB Terminal**

This terminal is a mini-B receptacle. You can use the supplied USB cable to connect to a computer or other digital devices with standard-A receptacles.

Connection Diagrams

In the following connection diagrams, the left side shows the terminals on the camcorder and the right side shows (for reference only) an example of terminals on a connected device.

Connection 1 HDMI

Type: Digital • Quality: High definition • Output only

Connect to a high-definition TV (HDTV) with an HDMI input terminal.

HDMI mini connector

HTC-100 High Speed HDMI Cable (optional)

HDMI connector (standard)

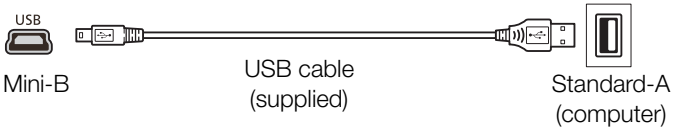
About the HDMI™ connection

The HDMI (High-Definition Multimedia Interface) connection (1) is a convenient all-digital connection using a single cable for both video and audio. When you connect the camcorder to an HDTV equipped with an HDMI terminal, you can enjoy video and audio playback at the highest quality. The camcorder adjusts the output resolution based on the capability of the HDTV.

Connection 2 USB

Type: Digital data connection · Output only

Connect to a computer to save your recordings.



- The HDMI terminal on the camcorder is for output only. Do not connect it to an HDMI output terminal on an external device, as this may damage the camcorder.

- If remaining battery time is an issue, you can power the camcorder using the compact power adapter so the battery pack will not be consumed.
- Correct operation cannot be guaranteed when connecting the camcorder to DVI monitors.
- Depending on the HDTV, correct playback of personal video content may not be possible using connection **1**.
- Sound from the built-in speaker will be muted while a cable is connected to the HDMI terminal.

- Audio and video will not be output from the HDMI terminal while using Wi-Fi functions and during interval recording, slow/fast motion and photo mode.
- AVCHD-compatible HDTVs and digital recorders with a compatible memory card slot can play back AVCHD movies you record with this camcorder. Refer to the instruction manual of the device used. Depending on the device used, correct playback may not be possible even if the device is AVCHD-compatible. In such case, play back the recordings on the memory card using the camcorder.

Playback on a TV Screen

Connect the camcorder to a TV to enjoy your recordings with family and friends.

1 Turn off the camcorder and the TV.

2 Connect the camcorder to the TV.

- Connection **1**. Refer to **Connection Diagrams** (📖 152).

3 Turn on the connected TV.

- On the TV, select as the video input the same terminal to which you connected the camcorder. Refer to the instruction manual of the connected TV.

4 Turn on the camcorder and set it to playback mode.

5 Open the desired index screen (📖 67, 75).

- Play back the desired movies or photos.

- HDMI output is not available during photo mode, interval recording and slow/fast recording.

Saving and Sharing Your Recordings

Converting Movies to MP4 Format

You can convert AVCHD and MP4 scenes to an MP4 scene with lower video quality (down-conversion) to obtain smaller file sizes. This is convenient, for example, when you want to upload videos to the Web, as smaller video files will upload more quickly. Additionally, when you convert a scene, you can apply unique cinema-look filters and decorations to the converted copy.
The converted movies are saved as new scenes so you always keep your original movies.

1 Open the [AVCHD] or [MP4] index screen (67).

2 Open the screen for selecting scenes to convert.

[Edit] > [Convert to MP4] > Desired video quality of converted movies*

* Before selecting the video quality, touch [Join Scenes] to join the converted movies into a single scene.

3 Touch the individual scenes you want to convert.

- A checkmark ✓ will appear on the scenes you touch. The total number of selected scenes will appear next to the ☑ icon.
- Touch a selected scene to remove the checkmark. To remove all checkmarks at once, touch [Remove All] ❯ [Yes].

4 After selecting all the desired scenes, touch [OK] and then touch [Next].

- **To add a cinema-look filter*:** The camcorder offers 7 cinema-look filters. You can read a description of each filter and preview its effect on the screen.

  [FILTER 1] ❯ Select the desired filter ❯ [OK]

- You can also touch the filter thumbnail in the center instead of touching [OK].
- To deactivate the cinema-look filter, touch [FILTER] again.
- You can add a cinema-look filter only to movies that were MP4 before conversion.

- **To add decorations*:**

[ ] Decorate the scene (📖 109)

* When a cinema-look filter is applied to a movie, you cannot add decorations.

5 Touch [START] to convert the scene.

- Touch [STOP] to interrupt the operation while it is in progress.

6 Touch [OK].

Options for converting and resizing movies

Video quality and resolution of the original scene	Video quality and resolution of the converted scene		
	24 Mbps (1920x1080)	17 Mbps (1920x1080)	4 Mbps (1280x720)
24 Mbps (1920x1080)	●	●	●
17 Mbps (1920x1080)	●	●	●
4 Mbps (1280x720)*	–	–	●

* For MP4 movies only.

- After repeatedly recording, deleting and editing scenes (fragmented memory), MP4 conversion may stop working correctly.
- The following scenes cannot be converted/resized using MP4 conversion.
  - Slow motion scenes recorded using 3 Mbps video quality ([x1/4] speed).
  - Interval scenes with the icon.

Saving Recordings on a Computer

Make sure to save your recordings on a computer on a regular basis. This section explains how to save your recordings on a computer using a USB connection. Use the software Transfer Utility LE[1] for AVCHD movies and the software ImageBrowser EX[2] for MP4 movies and photos.

[1] Software for AVCHD movies, available for free from PIXELA's Web site.

[2] Software for photos and MP4 movies, available for free from your local Canon Web site.

Saving AVCHD Movies (Windows only)

With the software Transfer Utility LE, you can save to your computer the AVCHD scenes you have recorded. Download the software and install it before you connect the camcorder to the computer for the first time. An Internet connection is required to download the software. Perform the following procedures while referring to the supplied ‘Transfer Utility LE Startup Guide’.

- Before installing the software, make sure your computer is connected to the Internet.

Installation

1 Download the zip file from PIXELA’s Web site.

- Visit PIXELA’s site to download the zip file, which contains the software and instruction manual.
  http://pixela.jp/cetule_dl

2 Uncompress the zip file.

- The zip file contains the installer (setup.exe) and the Software Guide (PDF file).

3 Run the installer to install the software.

- For details, refer to the Software Guide (PDF file) of PIXELA's software.

Connecting the Camcorder to a Computer

1 Camcorder: Power the camcorder using the compact power adapter.

2 Camcorder: Open the [AVCHD] index screen (67).

3 Connect the camcorder to the computer using the supplied USB cable.

- Connection **2**. Refer to **Connection Diagrams** (152).

4 Computer: Double-click the icon shown on the right.

5 Computer: Follow the onscreen instructions to complete the procedure.

- For details about using the software, refer to the Software Guide (PDF file) of PIXELA's software.

Saving MP4 Movies and Photos (Windows/ Mac OS)

With the software ImageBrowser EX you can save MP4 movies and photos to your computer and easily organize them. Refer to the ‘ImageBrowser EX User Guide’ (PDF file) for the full system requirements and other information. Additionally, you can use CANON iMAGE GATEWAY* to make online photo albums and more.

* This service may not be available in all countries/regions.

Format: AVCHD MP4 | Shooting mode | Playback

Installation

Install the software before you connect the camcorder to the computer for the first time. Make sure to install the software even if you have a different version of ImageBrowser EX on your computer. The auto-update function of the software may make available to you features optimized for this camcorder.
The ‘ImageBrowser EX User Guide’ will also be installed with the software.

- Before installing the software, make sure your computer is connected to the Internet.

1 Download the software from your local Canon Web site.

- Visit the following Web site to download ImageBrowser EX.
  http://www.canon.com/icpd/
  (Click on your country/region, select your camcorder model and the proceed to the download page.)

2 Install ImageBrowser EX.

- For details about opening the software package and running the installer, refer to the instructions on the download Web site.

3 Follow the onscreen instructions to select your area (continent), country/region and language.

- Available options will vary depending on your country/region.

4 In the main installer panel, click [Easy Installation].

- For Windows users, if a User Account Control dialog box appears, follow the instructions.

5 Follow the onscreen instructions to complete the installation.

- During the installation process, you may be prompted to install Microsoft Silverlight. Follow the instructions to do so.
- CameraWindow will also be installed.

To check that the software was installed correctly

You can check that the software was installed correctly by looking for the ImageBrowser EX icon in the following location.

Windows: The shortcut will be added to the Desktop.

Mac OS: The icon will appear in the Dock.

If you cannot find the icon, check your Internet connection and install the software again.

First-time connection to a computer running Windows
The first time you connect the camcorder to the computer, you also need to select the CameraWindow auto-launch setting.

Connecting the Camcorder to a Computer

1. Power the camcorder using the compact power adapter.
2. Open the [MP4] or [📷] index screen (📖 67, 75).
3. Connect the camcorder to the computer using the supplied USB cable.
   - Connection **2**. Refer to **Connection Diagrams** (📖 153).
   - Camcorder: When the connection is successfully established, [USB Connection] appears on the screen.
   - Computer: CameraWindow will start automatically. Windows users only: If you did not set up the auto-launch setting, open CameraWindow manually.
4. Save the MP4 movies and photos onto the computer.
   - Refer to **Non-EOS DIGITAL Cameras: Importing Images with CameraWindow** in the 'ImageBrowser EX User Guide'. This PDF file can be accessed through the **?** menu on the upper right of the ImageBrowser EX main screen.

- **When the camcorder is connected to a computer:**
  - Do not open the memory card slot cover.
  - Do not change or delete any of the memory card's folders or files directly from the computer as this may result in permanent data loss. When saving recordings on a computer, we recommend using the software described in this section (Transfer Utility LE for AVCHD movies; ImageBrowser EX for MP4 movies and photos).
- If you wish to use the recordings on your computer, make copies of them first. Use the copied files, retaining the originals.

- Depending on the computer, the software may not work correctly or you may not be able to play back movies.
- Interval scenes with the icon cannot be played back on a computer.
- Regardless of the camcorder's actual remaining battery charge, the remaining battery charge on the camcorder's details area of CameraWindow's main screen will always appear as full.
- The following types of MP4 scenes will be recognized as multiple files on a computer.
  - Scenes exceeding 4 GB.
  - Scenes exceeding 1 hour.
- **Users of Windows XP and later and Mac OS X:** Your camcorder is equipped with the standard Picture Transfer Protocol (PTP) allowing you to transfer photos (JPEG only) and MP4 movies simply by connecting the camcorder to a computer using the supplied USB cable, without having to install ImageBrowser EX.

Copying Recordings to an External Video Recorder

Connect the camcorder to Blu-ray Disc recorders and other AVCHD-compatible digital video recorders using the supplied USB cable to make perfect copies of your movies in high definition. If the external digital video recorder has an SD memory card slot*, you can use the memory card to copy your movies without connecting the camcorder.

* Make sure the external device is compatible with the type of memory card used.

Connecting

1. Power the camcorder using the compact power adapter.
2. Open the [AVCHD] index screen (📖 67).
3. Connect the camcorder to the digital video recorder using the supplied USB cable.
   - Connection **2**. Refer to **Connection Diagrams** (📖 152).

Recording

Details will vary depending on the device used so be sure to refer to the instruction manual of the digital video recorder.

Wi-Fi Functions

Overview of the Camcorder's Wi-Fi Functions

172 This is an introduction to the Wi-Fi functions offered by the camcorder and contains also important information about the supported Wi-Fi standards.

The Camcorder's Wi-Fi Functions

178 Refer to this section for details on how to use the camcorder's useful Wi-Fi functions such as controlling the camcorder remotely with an iOS or Android device* or playing back the camcorder's recordings from a Web browser on a Wi-Fi-equipped device.

Wi-Fi Connection and Settings

204

This section explains how to connect your camcorder to an access point (wireless router) on an existing Wi-Fi network as well as how to check the Wi-Fi settings and, if necessary, change them.

* “iOS device” is used in this text to refer to Wi-Fi-enabled iPhones and iPads, while “Android device” refers to Wi-Fi-enabled Android smartphones and tablets.

Overview of the Camcorder's Wi-Fi Functions

You can use the camcorder's Wi-Fi functions to connect wirelessly to Wi-Fi enabled devices* like smartphones or tablets and save, play back and upload your recordings. Refer to **Glossary** (📖 216) for a definition of some of the frequently used terms in this text.

* "iOS device" is used in this text to refer to Wi-Fi-enabled iPhones and iPads, while "Android device" refers to Wi-Fi-enabled Android smartphones and tablets.

iOS Devices

- Install the CameraAccess plus app and use your iPhone or iPad as a remote control to record with the camcorder (178). You can even stream video from the camcorder and record it directly on your iOS device.
- Installing the Movie Uploader app, you can save recordings on your iOS device and even upload them to YouTube or Facebook (191).
- Use a Web browser to access the camcorder and play back recordings on your iOS device (188).

CameraAccess plus

Movie Uploader

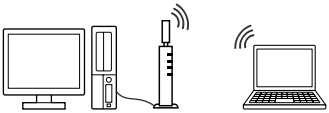
Android Devices

- Install the CameraAccess plus app and use your smartphone or tablet as a remote control to record with the camcorder (178). You can even stream video from the camcorder and record it directly on your Android device.
- Use a Web browser to access the camcorder and play back recordings on your Android device. You can also save a local copy on your Android device (188).

CameraAccess plus

Computers and Other Wi-Fi Devices

- On computers with a Wi-Fi receiver, use a Web browser to access the camcorder and play back recordings on the device. You can also save a local copy on the computer (188).
- Connect the camcorder to an access point as a media server and play back your recordings on computers and other devices connected to the same home network (201).



CANON iMAGE GATEWAY

- Connecting the camcorder to an access point (home network) connected to the Internet, you can also share recordings on CANON iMAGE GATEWAY and enjoy a number of Web services, including uploading recordings to Facebook and YouTube (193).

CANON iMAGE GATEWAY

Before Using Wi-Fi Functions

Based on the function, the camcorder will wirelessly connect directly to a Wi-Fi-enabled device, such as a smartphone, or to a Wi-Fi network via an access point (wireless router)*. After selecting the function you want to use, follow the onscreen directions to connect the camcorder.

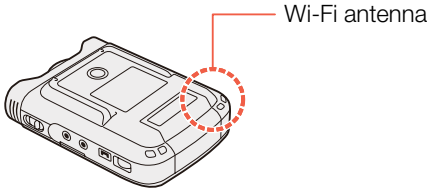
* Depending on the manufacturer, the access point may be referred to using a different name, such as wireless LAN router or wireless network router.

About the camcorder's Wi-Fi standard

The camcorder's Wi-Fi standard complies with the IEEE 802.11b/g/n protocol and operates in the 2.4 GHz band. As such, the maximum data transfer rate is 11 Mbps for IEEE 802.11b, 54 Mbps for IEEE 802.11g, and 150 Mbps for IEEE 802.11n. Note that these are theoretical values and actual data transfer rates may differ.

- Using an unprotected Wi-Fi network can expose your files and data to monitoring by unauthorized third parties. Be aware of the risks involved.

- We recommend inserting a fully charged battery pack or using the supplied CA-110E Compact Power Adapter when using Wi-Fi functions.
- When using the camcorder's Wi-Fi functions, do not cover the rear left corner of the camcorder with your hand or other object. The Wi-Fi antenna is located there and covering it may interfere with wireless signals.
- Do not open the memory card slot cover during the wireless connection.
- While using Wi-Fi functions, the camcorder's automatic power off function will be disabled.
- The camcorder's Wi-Fi functions cannot be used while the optional WM-V1 Wireless Microphone is connected to the camcorder.



The Camcorder's Wi-Fi Functions

Using an iOS or Android Device as a Remote Control

Using the CameraAccess plus app*, you can view the image streamed from the camcorder on your iOS/Android device even when the camcorder is somewhere else. You can use your iOS/Android device as a remote control to start recording on the camcorder and, while using the Monitor from Home function, you can even record the streamed image locally on your iOS/Android device.

* The CameraAccess plus app, provided by PIXELA, is available for free from the App Store (iOS devices) and Google Play™ (Android devices).

** Even if the camcorder was set to a different shooting mode, it will change automatically to AUTO mode when using CameraAccess plus.

- Before you perform these procedures for the first time, download and install the CameraAccess plus app on your iOS/Android device. The app can be downloaded for free from the following Web sites.
  App Store:
  http://appstore.com/cameraaccessplus

  Google Play™:
  http://play.google.com/store/apps/details?id=jp.co.pixela.cameraaccessplus

Streaming via Wi-Fi (Monitor from Home)

With this function, you can monitor the image streamed from the camcorder when it is in another location within Wi-Fi connection range, for example, in another room in the house. You can use your iOS/Android device to control the camcorder and record the streamed image on the camcorder or directly onto your device.

1 Camcorder: Set the camcorder to the desired recording mode (movie mode or photo mode).

2 Camcorder: Activate the [Monitor from Home] function.

HOME ▸ [Remote Control+Streaming] ▸ [Monitor from Home] ▸ [OK]

- The camcorder's SSID (network name) and password will appear.
- The camcorder will be ready to connect with the iOS or Android device.

3 iOS/Android device: In the Wi-Fi settings screen, turn on Wi-Fi and select the network name that appears on the camcorder's screen (step 2). If necessary, enter the password that appears on the camcorder's screen.

- The camcorder's network name (SSID) should appear in the list of networks/access points detected by the device.
- As long as you do not reset the camcorder's Wi-Fi password, you only need to enter the password the first time you connect the device.
- When the Wi-Fi connection is correctly established, [Connected] will appear on the camcorder's screen. To save battery power, the camcorder's screen will become dim after about 1 minute.

4 iOS/Android device: Start the CameraAccess plus app.

- Use the app's onscreen controls to operate the camcorder while viewing the live image on the device.

When you have finished recording

1. Camcorder: Touch [End] to end the wireless connection and turn off the camcorder.
2. iOS/Android device: Close the CameraAccess plus app.

Streaming via Wi-Fi and Internet (Monitor while Out)

With this function, you can leave the camcorder home and monitor the streamed image while you are away. You can even use your iOS/Android device to start recording on the camcorder. Using the Remote Monitoring Checker utility (for Windows only), you can check whether your home network's access point and Internet connection meet the requirements for using the Monitor while Out function*. For details about this program and links to the download page, visit PIXELA's Web site.
http://pixela.jp/cermc

* To use the Monitor while Out Function, an access point compatible with UPnP (Universal Plug and Play) and an Internet connection that can acquire global IP addresses are required.

1 Camcorder: Set the camcorder to the desired recording mode (movie mode or photo mode).

2 Activate the [Monitor while Out] function.

[Remote Control+Streaming] > [Monitor while Out] > [OK]

- You can also touch the icon in the center instead of touching [OK].
- The first time you activate the function, you will need to set a password and the port to be used by this function (steps 2 to 4). If you have already completed the settings for the Monitor while Out function, skip to step 6.

3 Touch [OK] to open the settings screen.

4 To enter the [Password] field, touch [Not configured]. Enter a unique password for the Monitor while Out function and touch [OK].

- The password is required for this function and must be between 4 and 8 characters long. We recommend using an 8-character password using a mix of numbers and uppercase/lowercase letters.
- To enter the password (and the port number in the next step), use the virtual keyboard (186).

5 To change the port number to be used, touch [80]. Enter a different port number and touch [OK].

- By default, the port number is set to 80 but you can change it if necessary.

6 If necessary, set up a connection to an access point.

- If you have previously configured and saved a connection to an access point, the camcorder will connect automatically to the last access point used. Continue to step 7.
- If no connections to access points have been saved in the camcorder, the message [Save the access point] will appear on the screen. Touch [OK] to configure and save a new access point connection (step 2 in **Wi-Fi Connection Using an Access Point** (📖 205)) before continuing with this procedure.

7 When the wireless connection is successfully established, the camcorder's ID will be displayed on the screen.

- The camcorder will be ready to connect with the iOS/Android device.

Connecting the iOS/Android Device

If the iOS/Android device is connected to the same Wi-Fi network as the camcorder, CameraAccess plus will recognize the camcorder's ID and register it automatically. Otherwise, you can enter the camcorder's ID manually.
As long as you do not reset the camcorder's settings, you only need to register the camcorder's ID the first time you connect the device. Later on, you only need to enter the Monitor while Out password (start this procedure from step 4).

To register the camcorder's ID in the CameraAccess plus app

1. If the iOS/Android device is near the camcorder, turn on Wi-Fi and select the same access point as that to which the camcorder is connected (step 6 in the previous procedure).
2. Start the CameraAccess plus app and touch Setting and then Start.
   - If the iOS device is not connected to the same access point as the camcorder, enter manually the camcorder's ID that is displayed on the camcorder's screen (step 7 in the previous procedure).

3 Touch Finish and close the CameraAccess plus app.
- If necessary, disconnect the iOS/Android device from the access point.

To use the Monitor while Out function

4 While you are out, start the CameraAccess plus app.
- Make sure the iOS/Android device is connected to a Wi-Fi access point.

5 Touch Start under Monitor while Out.

6 Enter the password for the Monitor while Out function that you set in the camcorder (step 4 of the previous procedure) and then touch Connect.
- Use the app's onscreen controls to operate the camcorder while viewing the live image on the device.

When you have finished recording

1 Camcorder: Touch [End] to end the wireless connection and turn off the camcorder.

2 iOS/Android device: Close the CameraAccess plus app.

Using the virtual keyboard

When you need to enter text for various settings, touch the text field and a virtual keyboard will appear on the screen. The illustration below explains the various keys you can use.

1 Switch between letters and numbers/special characters.

2 Change the position of the cursor.

3 Delete the character to the cursor's left (backspace).

4 Caps Lock. When the numerical keyboard is displayed, [#%?] switches between set 1 and set 2 of special characters.

- For details about the CameraAccess plus app, visit PIXELA's Web site.
  http://pixela.jp/cecap
- When using CameraAccess plus, you cannot switch between movie mode and photo mode. Make sure you set the desired recording mode in advance before activating the [Monitor from Home] or [Monitor while Out] function.
- There may be interruptions in the live video image or the response may be slow when starting/stopping recording a movie, taking a photo or changing the field of view.
- Using CameraAccess plus, the image is recorded exactly as it appears on the screen, regardless of the ⌂ ▸ [Flip/Rotate Image] ▸ [Detect Orientation] setting.
- Depending on the connection and the strength of the wireless signal, there may be interruptions in the live video image or the response may be slow.
- If you mount the camcorder on the optional CT-V1 Camera Pan Table, you can use the CameraAccess plus app on your iOS/Android device as a remote control to move the camcorder sideways (panning) in addition to starting/stopping recording. For details, refer to the instruction manual of the CT-V1.

Remote Browse: Viewing Recordings Using a Web Browser on an iOS or Android Device

With the Remote Browse function, you can use the Web browser on any device equipped with a Wi-Fi receiver (iOS/Android devices, computers, etc.) to access the camcorder. You can then play back your recordings using the Web browser and even save local copies of them on your device*.

* Depending on the device, OS, browser and video quality, you may not be able to play back or save recordings. For details, visit your local Canon Web site.

Format: AVCHD MP4 | Shooting mode | Playback

1 Camcorder: From any index screen, activate the Remote Browse mode.

[Wi-Fi] > [Playback via Browser] > [OK]

- You can also touch the icon in the center instead of touching [OK].
- The camcorder's SSID (network name) and password will appear.
- The camcorder will be ready to connect with the wireless device.

2 iOS/Android device: In the Wi-Fi settings screen, turn on Wi-Fi and select the network name that appears on the camcorder's screen (step 1). If necessary, enter the password that appears on the camcorder's screen.

- The camcorder's network name (SSID) should appear in the list of networks/access points detected by the device.
- As long as you do not reset the camcorder's Wi-Fi password, you only need to enter the password the first time you connect the device.

3 iOS/Android device: Start the Web browser.

4 iOS/Android device: Enter the URL that appears on the camcorder's screen into the Web browser's address bar.

- When the Wi-Fi connection is correctly established, the Playback via Browser screen will appear.
- The URL is always the same so you may find it convenient to bookmark the URL.

5 iOS/Android device: Touch the desired recording from the list.

- Touch the button on the top left of the screen to change the index screen displayed. Touch [AVCHD] (AVCHD movies), [MP4] (MP4 movies) or [📷] (photos).

- Touch a thumbnail to display the photo (or the first frame of a movie).
  MP4 movies only: Touch again to play back the movie.
- AVCHD movies cannot be played back.
- Interval scenes with the icon will not be shown.
- Touch to return to the index screen.
- Devices other than iOS devices: Touch to save a local copy of the movie/photo on the device.

When you have finished

Camcorder: Touch [End] [OK] to end the wireless connection and turn off the camcorder.

- The following types of MP4 scenes will be recognized as multiple files on other devices.
  - Scenes exceeding 4 GB.
  - Scenes exceeding 1 hour.
- For details about Wi-Fi connections on computers and other devices, refer to the instruction manual of the OS, computer or device used.

Saving Recordings and Uploading Movies to the Web Using an iOS Device

Using the Movie Uploader app*, you can play back and save your movies and photos on an iOS device. You can also upload your movies to YouTube and Facebook even when you are away from your home network.

* The Movie Uploader app, provided by PIXELA, is available for free from the App Store.

Format: AVCHD MP4 | Shooting mode | Playback

- Before you perform this procedure for the first time, install the Movie Uploader app on your iOS device. The app can be downloaded for free from the following Web site.
  http://appstore.com/movieuploader

1 Camcorder: From any index screen, set the camcorder to connect with the iOS device.

[Wi-Fi] [Movie Uploader] [OK]

- You can also touch the icon in the center instead of touching [OK].

- The camcorder's SSID (network name) and password will appear.
- The camcorder will be ready to connect with the iOS device.

2 iOS device: In the Wi-Fi settings screen, turn on Wi-Fi and select the network name that appears on the camcorder's screen (step 1). If necessary, enter the password that appears on the camcorder's screen.

- The camcorder's network name (SSID) should appear in the list of networks/access points detected by the device.
- As long as you do not reset the camcorder's Wi-Fi password, you only need to enter the password the first time you connect the device.
- When the Wi-Fi connection is correctly established, [Connected] will appear on the camcorder's screen.

3 iOS device: Use the Movie Uploader app to upload the camcorder's movies.

- You can also play back or save movies and photos on the iOS device.

When you have finished

Camcorder: Touch [End] ❯ [OK] to end the wireless connection and turn off the camcorder.

- Depending on factors such as the wireless network conditions, it can take some time to upload video files.
- The procedure above may differ depending on the version of iOS you are using.
- For details about the Movie Uploader app, visit PIXELA's Web site.
  http://www.pixela.co.jp/oem/canon/e/movieuploader/
- The following types of MP4 scenes will be recognized as multiple files on other devices.
  - Scenes exceeding 4 GB.
  - Scenes exceeding 1 hour.

Sharing Recordings with CANON iMAGE GATEWAY

After you register for CANON iMAGE GATEWAY*, you will be able to access various Web services**. You will be able to upload movies and photos to online albums, upload movies to Facebook and YouTube, send links to your online albums by e-mail to friends and family, and more! To use this function, you will need an access point connected to the Internet.

* Availability differs from area to area.

** "Web services" is used in this text to refer to various Internet services supported by CANON iMAGE GATEWAY.

Format: AVCHD MP4 | Shooting mode | Playback

CANON iMAGE GATEWAY

CANON iMAGE GATEWAY is a Web site that provides various photo-related services for owners of qualified Canon products. After you complete the free registration online, you can use the Web services, create online photo albums, and more. Visit Canon's Web site (also accessible using smartphones and tablets) for information on registration and countries/regions where you can use this service.
http://canon.com/cig

General requirements

- Completed free registration online for CANON iMAGE GATEWAY.
- Account settings for the services you plan to use (YouTube, Facebook, etc.). Available services may differ by country/region.

Setting the Desired Web Services in the Camcorder

Log in to CANON iMAGE GATEWAY and set the Web services you want to use.

1 Camcorder: From any index screen, activate the Web service function.

[Wi-Fi] > [To Web Service] > [OK]

- You can also touch the icon in the center instead of touching [OK].

2 Camcorder: If necessary, set up a connection to an access point.

- If you have previously configured and saved a connection to an access point, the camcorder will connect automatically to the last access point used. Continue to step 3.
- If no connections to access points have been saved in the camcorder, the message [Save the access point] will appear on the screen. Touch [OK] to configure and save a new access point connection (step 2 in **Wi-Fi Connection Using an Access Point** (205)) before continuing with this procedure.

3 Camcorder: When the wireless connection is successfully established, touch .

4 iOS/Android device: Following the camcorder's onscreen instructions, log in to CANON iMAGE GATEWAY.

- The online album screen will be displayed.

5 Camcorder: Touch [Authenticate].

- After a short while, an authentication code will be displayed on the screen.

6 iOS/Android device: Open the camera settings screen and enter the authentication code (from step 5).

7 Camcorder: Make sure the camcorder and iOS/Android device display the same confirmation number and then touch [OK].

8 iOS/Android device: Complete the setup process.

When you have finished

Camcorder: End the wireless connection and turn off the camcorder.

Adding/Deleting Web Services from the Camcorder

You can add more Web services to the camcorder or delete the ones that are already set.

1. iOS/Android device: Log in to CANON iMAGE GATEWAY and open the Web services settings screen.
2. iOS/Android device: Follow the onscreen instructions and add or delete the desired Web service(s).
3. Camcorder: On the [To Web Service] screen, touch .
   - The Web services set in the camcorder will be updated.

- Available Web services differ depending on the country/region of use and may be updated from time to time. For the latest details about available services and terms of use, visit your local CANON iMAGE GATEWAY Web site.
- If the date set in the camcorder is not correct, the camcorder cannot connect to CANON iMAGE GATEWAY. Make sure the date is correct before trying to establish a connection.

- Once you have set the maximum number of Web services in the camcorder, you will not be able to set any additional services. Delete unnecessary Web services and then set the desired Web service.
- You cannot set multiple accounts for Web services other than e-mail.

Sharing Your Recordings Using Web Services

Conveniently share your recordings with family and friends using Web services.

1 From any index screen, activate the Web service function.

[Wi-Fi] > [To Web Service] > [OK]

- You can also touch the icon in the center instead of touching [OK].
- If you have previously configured and saved a connection to an access point, the camcorder will connect automatically to the last access point used.

- If no connections to access points have been saved in the camcorder, the message [Save the access point] will appear on the screen. Touch [OK] to configure and save a new access point connection (step 2 in **Wi-Fi Connection Using an Access Point** (205)) before continuing with this procedure.

2 Select the desired Web service.

- When you select ✉ (e-mail), the list of registered e-mail addresses will appear. Select the e-mail addresses to which you want to send an e-mail notification.

3 Select the type of recording to upload.

4 Touch the scene or photo(s) to upload.

- When uploading photos, you can touch up to 10 photos to upload at a time. To cancel a selection, touch the photo to cancel. To cancel all selections at once, touch [Remove All] [Yes].
- Interval scenes with the icon cannot be selected.
- If you are uploading to YouTube, read the YouTube agreement carefully and touch [I Agree] if you agree.
- The upload will begin automatically.
- You can touch [Stop] to cancel the wireless transfer while it is in progress.

5 Touch [OK].

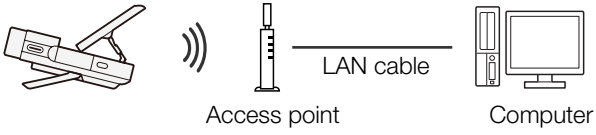
Checking your uploads using CANON iMAGE GATEWAY Library

You can use the CANON iMAGE GATEWAY Library or Album screen to see the movies and photos you uploaded. You can also check what files you have sent and the various settings for the Web services. For details on CANON iMAGE GATEWAY, refer to the Help module (in the upper right of the screen).

- The maximum length and file size for uploading depends on the Web service.
- For movies, you can upload one at a time; for photos, up to 10 at a time.
- Depending on the access point's (wireless router's) settings and capabilities, it can take some time to upload files.
- E-mail addresses must consist of single-byte characters. Only e-mail addresses with 16 or fewer characters before the @ mark can be set in the camcorder.

Wireless Playback on a Computer

Using the Media Server function, you can wirelessly view your movies and photos on your computer or similar device. You will need an access point connected to your home network and software installed on your computer that can play back movies and photos from a media server. We recommend that you connect the computer to the access point using a LAN cable. Refer also to the instruction manuals for the computer, software and access point.



Format: AVCHD MP4 | Shooting mode | Playback

1 Camcorder: From any index screen, activate the media server function.

HOME ▸ [Wi-Fi] ▸ [Media Server] ▸ [OK]

- You can also touch the icon in the center instead of touching [OK].
- If you have previously configured and saved a connection to an access point, the camcorder will connect automatically to the last access point used.
- If no connections to access points have been saved in the camcorder, the message [Save the access point] will appear on the screen. Touch [OK] to configure and save a new access point connection (step 2 in **Wi-Fi Connection Using an Access Point** (📖 205)) before continuing with this procedure.

2 Camcorder: When the wireless connection is successfully established, [Connected] will appear on the camcorder's screen.

- You can touch [View Information] to view the access point's SSID, connection protocol, and the camcorder's IP address and MAC address.
- After touching [View Information], you can touch [Change Connection Point] to select a different SSID saved in the camcorder in order to change access points.

3 Computer: Start your preferred media player software and select your camcorder's model name (Canon LEGRIA mini X) from the list of media servers.

- On standalone media players and other devices, connect the device to the home network and select your camcorder's model name from the list of media servers.

4 Computer: Play back the movies and photos.

- Interval scenes with the icon will not be shown.

5 Camcorder: Touch [End] [OK] when finished.

- Depending on the access point's (wireless router's) settings and capabilities, playback may take time to start or may not appear smooth. For details, refer to **Troubleshooting** (256).

Wi-Fi Connection and Settings

Wi-Fi Connection Using an Access Point

The camcorder can connect to a Wi-Fi network using an access point (wireless router) and even remember the settings for 4 access points.

General requirements

- Correctly configured router that complies with the 802.11b/g/n protocol and is Wi-Fi certified (bears the logo shown to the right) and a home network.

Format: AVCHD MP4 | Shooting mode | Playback

1 From any index screen, open the [Network Setup] screen.

> [Remote Control+Streaming] (from record standby mode) or [Wi-Fi] (from any index screen in playback mode) [Check/Edit Settings] [Access Point Connection Settings] [Not configured]

2 Touch the desired setup method.

- Depending on the setup method chosen, the procedure will be different. Read the descriptions below and continue with the procedure described in the relevant page.

Options

[WPS: Button]*

Simply press and hold the WPS button on your wireless router and then touch the camcorder's screen. This is the easiest connection method if you are using a WPS-compatible router. Continue the procedure as described in **Wi-Fi Protected Setup (WPS)** (📖 206).

[WPS: PIN Code]*

Access the access point's configuration screen using your Web browser. The camcorder will give you a PIN code, which you will enter into the browser. You will need a WPS-compatible router and a computer or other device connected to it. Continue the procedure as described in **Wi-Fi Protected Setup (WPS)** (📖 206).

[Search for Access Points]

Following the camcorder's onscreen instructions, you select the desired access point from a list and then enter your password. Continue the procedure as described in **Searching for Access Points** (📖 208)

[Manual Setup]

You manually enter the access point's name, password and other network settings. This method is recommended only for advanced users of Wi-Fi networks. Continue the procedure as described in **Manual Setup** (📖 210).

* WPS, which stands for Wi-Fi Protected Setup, is a standard that makes connecting to an access point easier.

Wi-Fi Protected Setup (WPS)

If your access point is WPS-compatible (bears the logo shown below), connecting the camcorder to it can be very easy. If you cannot successfully connect the camcorder using WPS, try using the [Search for Access Points] method. Refer also to the router's instruction manual.

1 [WPS: Button] method

- Press and hold the WPS button on the wireless router.
- Depending on the router, the amount of time required may differ.
- Make sure the router's WPS function is activated.

[WPS: PIN Code] method

- From a computer or similar device connected to the access point, use the Web browser to open the router's WPS settings screen. After the 8-digit PIN code appears on the camcorder's screen, enter it into your router's WPS settings screen.

2 Within 2 minutes, touch [OK] on the camcorder's screen.

- The camcorder will connect to the access point.
- You can touch [Stop] and then [OK] to interrupt the Wi-Fi Protected Setup while it is in progress.
- When the Wi-Fi Protected Setup is finished, [Configuration completed] will appear on the screen.

3 Touch [OK] to save the configuration.

- If you were in the process of performing another procedure, the camcorder will automatically connect to the access point. Return to the procedure of the function you were previously using:
  Step 7 in **Streaming via Wi-Fi and Internet (Monitor while Out)** (📖 183)
  Step 3 in **Setting the Desired Web Services in the Camcorder** (📖 196)
  Step 2 in **Sharing Your Recordings Using Web Services** (📖 199)
  Step 2 in **Wireless Playback on a Computer** (📖 202)
- Otherwise, touch [↩] [✕] to close the menu.

Searching for Access Points

After you touch [Search for Access Points], the camcorder will take a few seconds to detect access points available in the vicinity and will display the first one. Make a note in advance of the network name (SSID) and password (encryption key) of the access point you want to use. (This will usually be the wireless router on your home network.)
To enter text for the various settings, use the virtual keyboard (📖 186).

1 Select the desired access point.

- If the desired access point is not displayed, you can touch [▲] or [▼] to go through the list of detected access points. You can also touch [Search Again] to have the camcorder search for access points again.
- When the network name (SSID) of the desired access point appears, touch [OK].

2 To enter the [Encryption Key] field, touch [Not configured]. Enter the access point's password (encryption key) and touch [OK].

- If the access point selected in step 1 did not have a [🔒] icon, this step is not necessary.

3 Touch [OK] to save the configuration.

- If you were in the process of performing another procedure, the camcorder will automatically connect to the access point. Return to the procedure of the function you were previously using:
  Step 7 in **Streaming via Wi-Fi and Internet (Monitor while Out)** (📖 183)
  Step 3 in **Setting the Desired Web Services in the Camcorder** (📖 196)
  Step 2 in **Sharing Your Recordings Using Web Services** (📖 199)
  Step 2 in **Wireless Playback on a Computer** (📖 202)
- Otherwise, touch [↩] [✕] to close the menu.

■ Manual Setup

Perform this procedure to manually configure the wireless connection settings. This may be necessary, for example, if your access point's network name (SSID) cannot be detected due to the stealth function being enabled. Manual setup is for advanced users of Wi-Fi networks.
To enter text for the various settings, use the virtual keyboard (📖 186).

1. In the [SSID] field, enter the SSID. Touch [OK] and then touch [Next].
2. In the [Authentication/Encryption Method] field, touch [OPEN NONE] and then touch the desired method.
   - If you selected [OPEN WEP], the WEP index is 1.
3. In the [Encryption Key] field, enter the encryption key. Touch [OK] and then touch [Next].
   - If you selected [OPEN NONE] in step 2, this step is not necessary.
4. Touch [Automatic] or [Manual] to select how to obtain the IP address.
   - If you selected [Automatic], proceed to step 9.
5. To enter the [IP Address] field, touch [0.0.0.0]. Touch the first field and touch [▲]/[▼] to change the value. Change the rest of the fields in the same way and touch [OK].
6. Enter the [Subnet Mask] field in the same way and touch [Next].
7. Enter the [Default Gateway] field in the same way and touch [Next].

8 Enter the [Primary DNS Server] and [Secondary DNS Server] fields in the same way and touch [Next].

9 Touch [OK] to save the configuration.

- If you were in the process of performing another procedure, the camcorder will automatically connect to the access point. Return to the procedure of the function you were previously using:
  Step 7 in **Streaming via Wi-Fi and Internet (Monitor while Out)** (📖 183)
  Step 3 in **Setting the Desired Web Services in the Camcorder** (📖 196)
  Step 2 in **Sharing Your Recordings Using Web Services** (📖 199)
  Step 2 in **Wireless Playback on a Computer** (📖 202)
- Otherwise, touch [↩] [✕] to close the menu.

- The Wi-Fi functions available and the setup method will vary depending on the specifications and characteristics of the Wi-Fi network you want to use.

Viewing and Changing Wi-Fi Settings

You can review and change, if necessary, the settings used for the various Wi-Fi connections and for the Monitor while Out function.

1 From recording mode or any index screen, open the [Check Current Configuration] screen.

> [Remote Control+Streaming] (from record standby mode) or [Wi-Fi] (from any index screen in playback mode) [Check/Edit Settings] [OK]

- You can also touch the icon in the center instead of touching [OK].

To view the connection settings for iOS/Android devices

2 Touch [Smartphone Connection Settings].

- The camcorder's SSID and password will appear.

3 If necessary, change the camcorder's network name (SSID) and password.

[Edit] ▸ [OK] ▸ [OK]

- The next time you make a wireless connection, you will need to change the Wi-Fi settings on the iOS/Android device.

4 Touch [↩] repeatedly to return to the ⌂ (Home) menu, and then touch [✕] to close the menu.

To view the access point's connection settings

2 Touch [Access Point Connection Settings].

- The SSID settings of up to 4 access points in the camcorder's memory will appear.
- If there are available connection slots, you can touch [Not configured] to set up a new access point (📖 204).

3 Touch the SSID of the access point whose settings you want to view.

- The access point's settings will appear.
- Touch [▲] and [▼] to view more information.
- To delete the access point connection displayed, touch [Edit] ▸ [Delete] ▸ [Yes].

- To manually change the settings of the access point connection displayed, touch [Edit] ❯ [Manual Setup] and then perform the procedure in **Manual Setup** (📖 210).
- Touch [↩] to return to the access point selection screen.

4 Touch [↩] repeatedly to return to the 🏠 (Home) menu, and then touch [✕] to close the menu.

To view the settings for the Monitor while Out function (recording mode only)

2 Touch [Monitor while Out Settings].

- The password and port number to be used for the Monitor while Out function will appear.

3 If necessary, change the settings.

- Steps 4 and 5 in **Streaming via Wi-Fi and Internet (Monitor while Out)** (📖 181)

4 Touch [↩] repeatedly to return to the 🏠 (Home) menu, and then touch [✕] to close the menu.

Glossary

This is a glossary of some of the basic terms used frequently in this chapter. The documentation for your access point may also contain a glossary you can refer to.

Access Point
A wireless access point (WAP) is a device that allows wireless devices, like your camcorder, to connect to a wired network (including to the Internet) using the Wi-Fi standard. In most cases, this will be your wireless router.

IP Address
Exclusive number assigned to each device connected to the network.

SSID
Service Set Identifier. This is simply the public name of a Wi-Fi network.

WPS
Wi-Fi Protected Setup. Standard for easy and secure setup of Wi-Fi networks created by the Wi-Fi Alliance.

Additional Information

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Appendix: Menu Options Lists
This section contains tables of all the camcorder's menu settings and setting options for your reference.

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Appendix: Onscreen Icons and Displays
This section explains the icons and displays that appear on the camcorder's various screens, with reference pages to the relevant functions.

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Trouble?
Consult the troubleshooting advice and list of messages when you are experiencing some trouble with your camcorder.

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Do's and Don'ts
This section contains important handling precautions and maintenance instructions.

General Information

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This section contains information about optional accessories that can be used with the camcorder and ends with the comprehensive list of technical specifications.

Appendix: Menu Options Lists

The functions that are available depend on the camcorder's operating mode. On the camcorder's screen, menu items not available appear grayed out. For details about how to select an item, refer to **Using the Menus** (📖 46). For details about each function, see the reference page. Menu options without a reference page are explained after the tables. Menu options in blue and bold type, **like this**, indicate default values.

(Home) Menu

Menu item Setting options	
[Other Settings]	(📖 51, 222)
[Audio Scene] **[Standard]**, [Music], [Festival], [Speech], [Meeting], [Forest and Birds], [Noise Suppression], [Custom Setting]	(📖 118)
[Special Rec Modes] **[Normal Recording]**, [Interval Recording], [Slow Motion], [Fast Motion], [Video Snapshot], [Pre REC]	(📖 97, 101, 104)

(Home) Menu (cont.)

Menu item Setting options	
[Shooting Mode]	(📖 93)
[Macro], **[AUTO Auto]**, [Food and Fashion], [Sports], [Night Scene], [Beach], [Snow], [Car], [P Programmed AE]	
[Flip/Rotate Image]	(📖 113)
[Mirror Image]: [On], **[Off]** [Detect Orientation]: **[On]**, [Off]	
[Self Timer]	(📖 108)
[2sec 2 sec], [10sec 10 sec], **[OFF Off]**	
[Remote Control+Streaming]	(📖 178)
[Monitor from Home], [Monitor while Out], [Check/Edit Settings]	
[Photo Playback]	(📖 75)
[AVCHD Movie Playback]	(📖 67)
[MP4 Movie Playback]	(📖 67)
[MP4 Video Snapshot]	(📖 67)

(Home) Menu (cont.)

Menu item Setting options	
[Wi-Fi]	(📖 170)
[Movie Uploader], [Playback via Browser], [To Web Service], [Media Server], [Check/Edit Settings]	

[Edit] Functions in Playback Modes

Button Setting options	
[Convert to MP4]	(📖 156)
[Delete]	(📖 79)
[AVCHD] index screen: <date>, [Select], [All Scenes] [MP4] or [MP4] index screen: <folder name>, [Select], [All Scenes] [] index screen: <folder name>, [Select], [All Photos] During playback pause: [This Scene] In single photo view: [Proceed] (deletes the current photo)	
[Divide]	(📖 83)
[Trim]	(📖 85)

[Other Settings] Menus

/ Camera Setup (recording mode only)

Menu item Setting options	
[Movie Format] [AVCHD AVCHD], [MP4 MP4]	(📖 55)
[Video Quality] [24Mbps High Quality 24 Mbps], [17Mbps **Standard (Full HD) 17 Mbps]**, [4Mbps Long Play 4 Mbps]	(📖 90)
[Face Detection & Tracking] [ON On], [OFF Off]	(📖 144)
[Auto Backlight Correction] [ON On], [OFF Off]	–
[Auto Slow Shutter] [ON On], [OFF Off]	–
[Flicker Reduction] [OFF Off], [50Hz 50 Hz], [60Hz 60 Hz]	–
[Image Stabilizer] [ON On], [OFF Off]	–

/ Camera Setup (recording mode only) (cont.)

Menu item Setting options	
[Video Snapshot Length] [2sec 2 sec], **[4sec 4 sec]**, [8sec 8 sec]	(📖 104)
[Photo Size] **[L 4000x3000]**, [M 1920x1440], [S 640x480]	(📖 92)
[Photo Review Time] **[OFF Off]**, [2sec 2 sec], [4sec 4 sec], [6sec 6 sec], [8sec 8 sec], [10sec 10 sec]	–
[Onscreen Markers] **[OFF Off]**, [W Level (White)], [G Level (Gray)], [W Grid (White)], [G Grid (Gray)]	–

[Auto Backlight Correction]: The camcorder automatically corrects for backlight when shooting subjects with a strong light behind them.

- This function is not available when the shooting mode is set to , , or .

[Auto Slow Shutter]: For AVCHD movies only. The camcorder automatically uses slow shutter speeds to obtain brighter recordings in places with insufficient lighting.

- This function is only available when the shooting mode is set to AUTO or **P**.
- When you are recording moving subjects, if a trailing afterimage appears, set the slow shutter to [OFF Off].

[Flicker Reduction]: If the screen starts to flicker when recording movies under fluorescent lights, change the setting to reduce the effect.

- This function is only available when the shooting mode is set to **P**.
- Flicker reduction is not available while recording using slow/fast motion.
- When using this function in dark surroundings, the recorded image may become darker.

[Image Stabilizer]: The image stabilizer reduces camcorder blur (blur due to the camcorder moving) so you can get nice, stable shots.

- The image stabilizer is not available in the following cases:
  - When recording using slow or fast motion.
  - When the field of view is ultra wide.
  - When the camcorder is in photo mode.
  - When using [Remote Control+Streaming].

- For AVCHD movies, the image will appear wider when the image stabilizer is set to [ON On].
- When using this function in dark surroundings, the recorded image may become darker.

[Photo Review Time] (photo mode only)**:** Selects the time to display a photo after it is recorded.

[Onscreen Markers]: You can display a grid or a horizontal line at the center of the screen. Use the markers as a reference to make sure your subject is framed correctly (vertically and/or horizontally).

- Using the onscreen markers will not affect the recordings.

Playback Setup (playback mode only)

Menu item Setting options	
[Video Snapshot Length] [2sec 2 sec], **[4sec 4 sec]**, [8sec 8 sec]	(📖 147)
[Slideshow Transition] [OFF Off], [Dissolve], **[Slide Image]**	–
[Auto Rotate] **[ON On]**, [OFF Off]	–
[Display Date/Time] [ON On], **[OFF Off]**	–

[Slideshow Transition]: You can select the transition effect between photos in a slideshow.
[Dissolve]: The currently displayed photo fades away while the next photo fades in.
[Slide Image]: Photos slide to the left as the slideshow advances.

[Auto Rotate]: When set to [ON On], the camcorder will display in the correct orientation photos that were recorded with the camcorder held vertically, if at the time of recording, [Detect Orientation] was set to [On].

[Display Date/Time]: Select whether to display the recording date and time during playback.

- During AVCHD movie and photo playback, both the date and time are displayed. During MP4 movie playback, only the date is displayed.

Audio Setup

Menu item Setting options	
[Built-in Mic Wind Screen]	(📖 126)
[H Auto (High)], [L Auto (Low)], [OFF Off]	
[Built-in Mic Att.]	(📖 127)
[A Automatic], [ON On], [OFF Off]	
[Built-in Mic Freq. Response]	(📖 129)
[NORM Normal], [LB Boost LF Range], [LC Low Cut Filter], [MB Boost MF Range], [LHB Boost HF+LF Range]	
[Built-in Mic Directionality]	(📖 130)
[2ch MONO Monaural], **[NORM Normal]**, [2ch WIDE Wide]	
[MIC Att.]	(📖 127)
[A Automatic], [ON On], [OFF Off]	

Audio Setup (cont.)

Menu item Setting options	
[MIC Low Cut] [ON On], **[OFF Off]**	(📖 132)
[MIC Terminal Input] [LINE External Audio], **[MIC Microphone]**	(📖 133)
[Audio Mix] **[OFF Off]**, [ON On] When [ON On] is selected: audio mix bar, [Internal Microphone]/[MIC Terminal Input]	(📖 134)
[Audio Limiter] **[ON On]**, [OFF Off]	(📖 135)
[Audio Compressor] [**H** High], **[L Low]**, [OFF Off]	(📖 135)
[Headphone Volume] 🎧▬▬🎧, OFF 0-15 **(8)**	(📖 137)

Audio Setup (cont.)

Menu item Setting options	
[Speaker Volume] , OFF 0-15 **(8)**	(📖 69)
[Notification Sounds] **[High Volume]**, [Low Volume], [OFF Off]	–

[Notification Sounds]: A beep will accompany some operations like turning on the camcorder, the self-timer countdown, etc.

- Set to [OFF Off] to turn off notification sounds.

System Setup

Menu item Setting options	
[Language]	(39)
[Česky], [Dansk], [Deutsch], [Ελληνικά], **[English]**, [Español], [Français], [Italiano], [Magyar], [Melayu], [Nederlands], [Norsk], [Polski], [Português], [Română], [Suomi], [Svenska], [Türkçe], [Русский], [Українська], [العربية], [فارسی], [ภาษาไทย], [简体中文], [繁體中文], [한국어], [日本語]	
[Time Zone/DST]	(42)
[] (home time zone) or [] (travel time zone): **[Paris]**, list of world time zones [] (DST adjustment): Toggle on or **off**	
[Date/Time]	(39)
[Date/Time]: – [Date Format]: [Y.M.D], [M.D,Y], **[D.M.Y]** (Y- year, M- month, D- day) [24H]: Toggle on (24-hour clock) or **off (12-hour clock)**	
[LCD Brightness]	–

System Setup (cont.)

Menu item Setting options	
[LCD Backlight] [**H** Bright], **[M Normal]**, [**L** Dim]	–
[Available Space in Memory]	–
[Used Space in Memory]	–
[File Numbering] [Reset], **[Continuous]**	–
[Auto Power Off] **[ON On]**, [OFF Off]	–
[HDMI Status]	–
[Output Onscreen Displays] **[ON On]**, [OFF Off]	–
[Initialize SD] [Complete Initialization]: Toggle on or **off**	(📖 43)
[Firmware]	–
[Certification Logo Display]	–
[Demo Mode] **[ON On]**, [OFF Off]	–

System Setup (cont.)

Menu item Setting options	
[Reset All]	–
[No], [Yes]	

[LCD Brightness]: Adjusts the brightness of the LCD screen.

- Changing the brightness of the LCD screen does not affect the brightness of your recordings or the brightness of the playback image on a TV.

[LCD Backlight]: Sets the screen to one of three brightness levels. You can use this to make the screen brighter when recording in bright places, for example.

- Changing the brightness of the LCD screen does not affect the brightness of your recordings or the brightness of the playback image on a TV.
- Using the [**H** Bright] setting will shorten the effective usage time of the battery pack.
- While [**L** Dim] is selected, the power/charge indicator will turn on in green.

[Available Space in Memory] (recording mode only)/ **[Used Space in Memory]** (playback mode only)**:** Displays a screen where you can verify how much of the memory card is currently available for recording or how much is in use (📷 indicates photos).

- Estimated figures about available movie recording time and available number of photos are approximate and based on the currently selected video quality and photo size.
- The information screen displays also the Speed Class rating of the memory card.

[File Numbering]: MP4 movies and photos are saved on the memory card as files in folders, which are assigned consecutive file numbers. This setting determines how files are numbered.
[🔁 Reset]: File numbers will restart from 100-0001 every time you record on a memory card that has been initialized.
[⟶ Continuous]: File numbers will continue from the number following that of the last file recorded with the camcorder.

- If the memory card you insert already contains a file with a larger number, a new file will be assigned a number one higher than that of the last file on the memory card.
- We recommend using the [⟶ Continuous] setting.
- Folders can contain up to 500 files (MP4 movies and photos combined).

- File numbers consist of 7 digits, for example “101-0107”. The 3 digits before the hyphen indicate the folder where the file is saved and can range from 100 to 999. The 4 digits after the hyphen are a unique identifier for each file and can range from 0001 to 9900.
- The last four digits of the folder name indicate the date when the folder was created.
- The file number and folder name also indicate the location of the file on the memory card. A recording with the file number “101-0107”, made on October 25 will be found in the folder DCIM\101_1025. If it is an MP4 movie, its file name will be MVI_0107.MP4; if it is a photo, its file name will be IMG_0107.JPG.
- All the interval scenes recorded during one interval recording sequence are saved in separate folders indicated by the letter “**I**” instead of an underscore (ex. “101**I**1025”).

[Auto Power Off]: In order to save power when the camcorder is powered by a battery pack, it will automatically shut off if left without any operation for 3 minutes.

- Approximately 30 seconds before the camcorder shuts off, [Auto Power Off] will appear. Operating any of the camcorder’s controls while the message is displayed will prevent the camcorder from shutting off.

[HDMI Status]: Displays a screen where you can verify the standard of the output signal from the HDMI terminal.

[Output Onscreen Displays] (playback mode only)**:** When set to [ON On], the camcorder's onscreen displays will appear also on the screen of a TV or monitor connected to the camcorder.

[Firmware] (playback mode only)**:** You can verify the current version of the camcorder's firmware, which is the software that controls the camcorder. This menu option is usually unavailable.

[Certification Logo Display]: This displays select certification logos that apply to this camcorder.

- The certification logos apply to Australia and New Zealand only.

[Demo Mode]: The demonstration mode displays the camcorder's main features. It starts automatically when the camcorder is powered using the compact power adapter if you leave it in record standby mode without a memory card for more than 5 minutes.

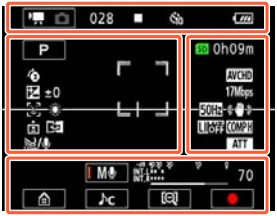
- To cancel the demo mode once it has started, press any button or turn off the camcorder.

[Reset All]: Resets all of the camcorder's settings, including any stored access point connections, passwords and other Wi-Fi settings.

Appendix: Onscreen Icons and Displays

The following tables show the icons that appear in the various modes. For easy reference, the icons in the table are grouped according to the area in which they appear on the screen.
Please note that what icons appear depends on the movie format, shooting mode, and other functions.
For details about each function, see the reference page.

Recording mode



Icons on the top of the screen

Icon	Description/Function	🕮
	The left side shows the current recording mode (movie or photo mode) while the right side shows the new recording mode when this control button is touched.	60
00:00:00:00 (for AVCHD movies)	Time code (hours : minutes : seconds : frames)	244
0:00:00 (for MP4 movies)	Scene counter (hours: minutes : seconds)	
000 (for AVCHD movies)	Total number of scenes	-
● ■	Memory card operation	244
	Self timer and countdown	108
	Remaining battery charge	244

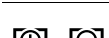
Icons on the left side of the screen

Icon	Description/Function	🕮
AUTO P	Shooting mode button (In AUTO mode: Smart AUTO icons)	93 65
	Special recording modes and, if applicable, an icon indicating an interval of time for that function.	245
±0	Exposure compensation	141
	Face detection. When a face is detected, a white frame will also appear around the main subject's face.	144
AWB	White balance	139
	Onscreen markers	225
	User-selected face detection frame	144
	Orientation detection	113
	Mirror image recording	113
Low OFF	Built-in microphone's wind screen	126

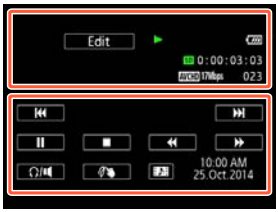
Icons on the right side of the screen

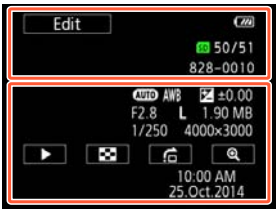
Icon	Description/Function	🕮
SD 0h00m	Remaining video recording time	245
SD 0000	Remaining available number of photos	245
LPCM	Linear PCM audio	90
AVCHD MP4	Movie format	55
L M S	Photo size	92
25P	Frame rate	-
24 Mbps 17 Mbps 4 Mbps	Video quality	90
	Onscreen markers	225
	User-selected face detection frame	144
50Hz 60Hz	Flicker reduction	224
	Image stabilizer	224
LIMOFF	Audio limiter	135
COMPH COMPOFF	Audio compressor	135
ATT AOFF	Built-in microphone attenuator	127

Icons on the bottom of the screen

Icon	Description/Function	🕮
	[ ] button: Open the (Home) menu	47
	Audio scene button: Change the audio scene.	118
	Audio recording mode button and audio level indicator: Switch between manual and automatic audio recording level	124
	[/] button: Change the field of view	59
● ■	[●]/[■] button: Start/Stop recording a movie	57
PHOTO	[PHOTO] button: Take a photo	62

Playback mode





Icons on the top of the screen

Icon	Description/Function	🕮
	[ ] button: Mirror image playback	72
	[ ] button: Repeat playback	72
Edit	[Edit] button: Open the [Edit] panel	221
▶ ❚❚ ◀❙ ❙▶ ◀◀ ▶▶ ◀❚❚ ❚❚▶	Memory card operation	244
	Interval scenes that have not yet been joined.	97
	Slow/Fast motion and playback speed.	101
LPCM	Linear PCM audio	90

Icons on the top of the screen (cont.)

Icon	Description/Function	🕮
00:00:00:00 (for AVCHD movies)	Scene playback time code (hours : minutes : seconds : frames)	244
0:00:00 (for MP4 movies)	Scene playback time (hours: minutes : seconds)	
SD 00/00	Current photo / Total number of photos	-
AVCHD MP4	Movie format	55
24 Mbps 17 Mbps 4 Mbps	Video quality	90
000	Scene number	-
000-0000	File number	233

Icons on the bottom of the screen

Icon	Description/Function	🕮
For movies: ⏮ ⏭ ⏸ ▶ ■ ◀◀ ▶▶ ◂❙ ❙▸	Playback control buttons	70
For photos: ▶	[▶] button: Slideshow	86

Icons on the bottom of the screen (cont.)

Icon	Description/Function	🕮
🎧/🔈	[🎧/🔈] button: Volume	69
PHOTO	[PHOTO] button: Capture a photo	149
🤚	[🤚] button: Decoration	110
🎞	[🎞] button: Capture a video snapshot scene	147
AUTO AWB ±0.00 F2.8 L 1.90 MB 1/250 4000×3000	Shooting information	245
▦	[▦] button: Return to the [📷] index screen	75
🖼	[🖼] button: Photo jump	77
🔍+ 🔍−	[🔍+]/[🔍−] button: Increase/decrease magnification for photo playback	77
10:00 AM 25.Oct.2014	Recording date and time	227

Time code/Scene counter

Both the time code and scene counter are counters that advance only when recording. The time code starts at 0:00:00:00 every time you record a new scene.

Memory card operation

● Record, ■ Record standby, ▶ Playback, ❚❚ Playback pause, ▶▶ Fast playback, ◀◀ Fast reverse playback, ❙▶ Slow playback, ◀❙ Slow reverse playback, ❚❚▶ Frame advance, ◀❚❚ Frame reverse.

Remaining battery charge

- The icon shows a rough estimate of the remaining charge of the battery pack.
- When the battery charge becomes low, replace or charge the battery pack. Depending on the condition of the camcorder or battery, the actual battery charge may not match what is displayed on the screen.
- When you insert an empty battery pack, the power may turn off without displaying .

Special recording modes

- Interval recording and selected interval (97)
- Slow motion and selected speed (101)
- Fast motion and selected speed (101)
- Video snapshot and selected video snapshot length (104)
- Pre-recording (105)

Remaining video recording time

When there is no more free space on the memory card, SD and [End] will be displayed (in red) on the screen and the recording will stop.

Remaining available number of photos

Even if the remaining number of photos that can be recorded is larger, the maximum number displayed on this screen is [9999].

Shooting information

AUTO Shooting mode, AWB White balance,
±0.00 Exposure, F2.8 Aperture number,
1/250 Shutter speed, **L** 4000×3000 Photo size,
1.90 MB File size

Troubleshooting

If you have a problem with your camcorder, refer to this section. Sometimes what you think is a malfunction of the camcorder may have the simplest of solutions - please read the “CHECK THIS FIRST” box before going on to the more detailed problems and solutions. Consult your dealer or a Canon Service Center if the problem persists.

CHECK THIS FIRST

Power supply

- Is the battery charged? Is the compact power adapter correctly connected to the camcorder? (📖 30)

Recording

- Did you turn the camcorder on and correctly set it to recording mode? (📖 57, 62) Is a compatible memory card correctly inserted into the camcorder? (📖 37)

Playback

- Did you turn the camcorder on and correctly set it to playback mode? (📖 67, 75) Is a compatible memory card correctly inserted into the camcorder? (📖 37) Does it contain any recordings?

Power Source

The camcorder will not turn on or it turns off by itself.

- The battery pack is exhausted. Replace or charge the battery pack.
- Remove the battery pack and insert it correctly.

Cannot charge the battery pack.

- Make sure the camcorder is off so charging can start.
- The temperature of the battery pack is outside its operating range (approximately 0 – 40 °C). Remove the battery pack, warm it or let it cool down, as necessary, and try charging it again.
- Charge the battery pack in temperatures between approximately 0 °C and 40 °C.
- If you are using a battery pack recommended by Canon for use with this camcorder, there may be a problem with the battery pack. Consult a Canon Service Center.

A noise can be heard from the compact power adapter.

- A faint sound can be heard while the compact power adapter is connected to a power outlet. This is not a malfunction.

The battery pack is exhausted extremely quickly even at normal temperatures.

- The battery may have reached the end of its battery life. Buy a new battery pack.

Recording

Pressing the start/stop button or touching [●] will not start recording.

- You cannot record while the camcorder is writing previous recordings onto the memory card (while the ACCESS indicator is on or flashing). Wait until the camcorder has finished.
- The memory is full or it already contains the maximum number of scenes of AVCHD movies (3,999 scenes). Delete some recordings (📖 79) or initialize the memory card (📖 43) to free some space.
- The file numbers for MP4 movies and photos have reached their maximum value. Set [File Numbering] to [Reset] and insert a new memory card.

The point where the start/stop button was pressed or [●]/[■] was touched does not match the beginning/end of the recording.

- There is a slight interval between pressing/touching the button and the actual start/end of recording. This is not a malfunction.

When a subject flits across in front of the lens, the image appears slightly bent.

- This is a phenomenon typical of CMOS image sensors. When a subject crosses very quickly in front of the camcorder, the image may seem slightly warped. This is not a malfunction.

Changing the operating mode between recording (●)/recording standby (■)/playback (▶) takes longer than usual.

- When the memory card contains a large number of scenes, some operations may take longer than usual. Save your recordings (📖 159) and initialize the memory card (📖 43).

Movies or photos cannot be recorded properly.

- This may occur as movies and photos are recorded/deleted over time. Save your recordings (📖 159) and initialize the memory card using the [Complete Initialization] option (📖 43).

After using the camcorder for a long time, it becomes hot.

- The camcorder may become hot after using it continuously for long periods of time; this is not a malfunction. If the camcorder becomes unusually hot or it becomes hot after using it only for a short while, it may indicate a problem with the camcorder. Consult a Canon Service Center.

Playback

Deleting scenes takes longer than usual.

- When the memory card contains a large number of scenes, some operations may take longer than usual. Save your recordings (159) and initialize the memory card (43).

Cannot capture a video snapshot scene from a movie.

- You cannot capture video snapshot scenes from scenes recorded or edited using another device and then transferred to a memory card connected to the computer.
- The memory card is full. Delete some recordings (79) to free some space.

Cannot mark individual scenes/photos in the index screen with a checkmark ✓.

- You cannot select more than 100 scenes/photos individually. Select the [All Scenes] or [All Photos] option instead of [Select].

Indicators and Onscreen Displays

** or appears (in red) on the screen.**

- Battery pack is exhausted. Replace the battery pack with a fully charged one.

or appears (in red) on the screen and the camcorder cannot be turned off and on.

- Battery pack is exhausted. Replace the battery pack with a fully charged one.

appears (in red) on the screen.

- A memory card error occurred. Turn off the camcorder. Remove and reinsert the memory card. Initialize the memory card if the display does not change back to normal.

and [End] appear (in red) on the screen.

- The memory card is full. Replace the memory card or delete some recordings (79) to free some space on the memory card.
- The folder and file numbers have reached their maximum value. Set [File Numbering] to [Reset] and delete all the movies and photos (79) on the memory card or initialize it (43).

Even after stopping recording, the ACCESS indicator does not go off.

- The scene is being recorded on the memory card. This is not a malfunction.

The red power/charge indicator flashes rapidly (one flash at 0.5-second intervals).

- The temperature of the battery pack is outside its operating range (approximately 0 – 40 °C). Remove the battery pack, warm it or let it cool down, as necessary, and try charging it again.
- Charge the battery pack in temperatures between approximately 0 °C and 40 °C.
- The battery pack is damaged. Use a different battery pack.
- Charging has stopped because the compact power adapter or the battery pack is faulty. Consult a Canon Service Center.

Picture and Sound

The screen appears too dark.

- The LCD screen was dimmed. Change the [LCD Backlight] setting to [Normal] or [Bright].

Screen displays turn on and off repeatedly.

- The battery pack is exhausted. Replace or charge the battery pack.
- Remove the battery pack and insert it correctly.

Abnormal characters appear on the screen and the camcorder does not operate properly.

- Remove the battery pack and insert it after a few moments.

Video noise appears on screen or noise can be heard in the audio.

- Keep a distance between the camcorder and devices that emit strong electromagnetic fields (plasma TVs, cellular phones, etc.).
- An external microphone may pick up noise while Wi-Fi functions are in use. Keep a distance between the camcorder and microphone.

Horizontal bands appear on the screen.

- This is a phenomenon typical of CMOS image sensors when recording under some types of fluorescent, mercury or sodium lamps. This is not a malfunction. To reduce the symptoms, change the [Flicker Reduction] setting.

Sound is distorted or is recorded at lower levels.

- When recording near loud sounds (such as fireworks, shows or concerts), sound may become distorted or it may not be recorded at the actual levels. This is not a malfunction. Adjust the audio recording level manually (124).

The picture is displayed correctly but there is no sound from the built-in speaker.

- Speaker volume is turned off. Adjust the volume (69).
- Sound will not be output from the built-in speaker while headphones or the optional HTC-100 High Speed HDMI cable is connected to the camcorder.

There is no sound from the (headphones) terminal.

- Audio will not be output from the camcorder while Wi-Fi functions are in use.

Memory Card and Accessories

Cannot insert the memory card.

- The memory card was not facing the correct direction. Turn the memory card over and insert it.

Cannot record on the memory card.

- The memory card is full. Delete some recordings (79) to free some space or replace the memory card.
- Initialize the memory card using the [Complete Initialization] option (43) when you use it with the camcorder for the first time.
- A compatible memory card must be used to be able to record movies on a memory card (35).
- The folder and file numbers for MP4 movies and photos have reached their maximum value. Set > > [File Numbering] to [Reset] and insert a new memory card.

Connections with External Devices

Video noise appears on the TV screen.

- When using the camcorder in a room where a TV is located, keep a distance between the compact power adapter and the power or antenna cables of the TV.

There is no image on the TV screen and there is no sound.

- The video input on the TV is not set to the video terminal to which you connected the camcorder. Select the correct video input.
- Disconnect the optional HTC-100 High Speed HDMI cable and then restore the connection or turn the camcorder off and then on again.
- Video and audio will not be output from the camcorder while Wi-Fi functions are in use.

The computer does not recognize the camcorder even though the camcorder is connected correctly.

- Disconnect the USB cable and turn off the camcorder. After a short while, turn it on again and restore the connection.
- Connect the camcorder to a different USB port on the computer.

Cannot save recordings on my computer

- When the memory card contains too many recordings (Windows – 2,500 or more photos/MP4 movies, Mac OS – 1,000 or more photos/MP4 movies), you may not be able to transfer recordings to a computer. Try using a card reader.

Wi-Fi Functions

Refer also to the instruction manual of your access point and other devices you will use.

Cannot connect with the access point.

- Check that the access point is working correctly.
- The effective communication range between the camcorder and access point may vary depending on the strength of the wireless signal. Try using the camcorder closer to the access point.
- Cordless phones, microwave ovens, refrigerators and other appliances in the line of sight between the access point and the camcorder may interfere with the wireless signal. Try using the camcorder in a location farther away from such appliances.

- Wi-Fi networks with a stealth function that do not broadcast their network name (SSID) will not be detected by the camcorder during the Wi-Fi network setup. Perform the setup manually (📖 210) or turn off the stealth function of the access point.

Wireless playback on a computer or similar device is not smooth.

- Playback may not be smooth depending on the access point's settings and capabilities.
- Connect the computer to the access point using a LAN cable.
- Remove any objects between the camcorder and wireless access point that may interfere with the wireless signal.
- Move the camcorder closer to the wireless access point.
- Turn off the wireless functions of other wireless devices other than the computer or similar device being used for playback.
- Switch the wireless access point to IEEE 802.11n. Refer to its instruction manual for details.
- If these do not solve the issue, the cause may be due the device or conditions unique to the surrounding area. Use the optional HTC-100 High Speed HDMI cable to connect the camcorder to a TV (📖 154).

The wireless connection was interrupted while transferring files.

- Incomplete files may remain at the transfer destination. If incomplete files remain at the transfer destination, check the content and make sure they are safe to delete before deleting them.
- Select [New Files] and perform the file transfer again.

Cannot complete a wireless connection to the camcorder.

- Resetting the camcorder's settings using [Reset All] will reset the camcorder's SSID (network name) and change the network passwords. Erase the camcorder's previous network settings from the iOS or Android device and connect the device to the camcorder again.

The Playback via Browser screen does not appear correctly on the Web browser.

- The device, operating system or Web browser used may not be supported. For the latest information about supported systems, visit your local Canon Web site.
- Enable JavaScript and cookies in your Web browser's settings. For details, refer to the help modules or online documentation of the Web browser used.

List of Messages (in alphabetical order)

Refer to **List of Messages for Wi-Fi Functions** (📖 268) for a list of messages related to general Wi-Fi functions, and **List of Messages for Web Services** (📖 274) for messages related to Web services when using CANON iMAGE GATEWAY.

Back up recordings regularly

- This message may appear when you turn on the camcorder. In the event of a malfunction, recordings may be lost so back up your recordings regularly.

Battery communication error. Does this battery display the Canon logo?

- This may be due to using a battery pack not recommended by Canon for use with this camcorder.
- If you are using a battery pack recommended by Canon for use with this camcorder, there may be a problem with the battery pack or camcorder. Consult a Canon Service Center.

Cannot convert scenes recorded using interval recording.

- Interval scenes with the icon cannot be converted or resized. Join the interval scenes into a single scene (📖 100).

Cannot convert the scene

- Scenes that were recorded or edited with other devices and then transferred to a memory card connected to the computer, cannot be converted to MP4 scenes.

Cannot divide the scene

- The scene could not be divided because the camcorder's internal scene management data log is full. Delete some scenes and photos (📖 79) and try dividing the scene again.

Cannot load canvas

- The canvas file that was saved on the memory card is corrupted.
- Canvas data cannot be read from canvas files created using other devices and then transferred to a memory card connected to the computer.

Cannot play back

- You may not be able to play back scenes that were recorded with other devices or created or edited on a computer and then transferred to a memory card connected to the computer.
- There is a problem with the memory card. If this message appears often without apparent reason, contact a Canon Service Center.

Cannot play back Check the memory card

- There is a problem with the memory card. Save your recordings (📖 159) and initialize the memory card using the [Complete Initialization] option (📖 43). If the problem persists, use a different memory card.

Cannot play the movies on this memory card

- Movies cannot be played back from a 64 MB or smaller memory card. Use a recommended memory card (📖 35).

Cannot play the movies on this memory card Initialize only using the camcorder

- The memory card in the camcorder was initialized using a computer. Initialize the memory card with this camcorder (📖 43).

Cannot record

- You cannot capture video snapshot scenes from scenes recorded or edited using another device and then transferred to a memory card connected to the computer.
- There is a problem with the memory card. If this message appears often without apparent reason, contact a Canon Service Center.

Cannot record Check the memory card

- There is a problem with the memory card. Save your recordings (📖 159) and initialize the memory card using the [Complete Initialization] option (📖 43). If the problem persists, use a different memory card.

Cannot record movies on this memory card

- Movies cannot be recorded on a 64 MB or smaller memory card. Use a recommended memory card (📖 35).

Cannot record movies on this memory card Initialize only using the camcorder

- The memory card in the camcorder was initialized using a computer. Initialize the memory card with this camcorder (📖 43).

Cannot save the canvas

- Cannot save your [Pens and Stamps] drawings on the memory card. Save your recordings (📖 159) and initialize the memory card (📖 43).

Cannot trim the scene

- Scenes that were recorded or edited with other devices and then transferred to a memory card connected to the computer, cannot be trimmed with this camcorder.

Charge the battery pack

- Battery pack is exhausted. Charge the battery pack.

Check the memory card

- Cannot access the memory card. Check the memory card and make sure it is inserted correctly.
- A memory card error occurred. The camcorder cannot record or display the image. Try removing and reinserting the memory card, or use a different memory card.
- You inserted a MultiMedia Card (MMC) into the camcorder. Use a recommended memory card (📖 35).

- If after the message disappears, SD appears in red, perform the following: Turn off the camcorder and remove and reinsert the memory card. If SD turns back to green you can resume recording/playback. If the problem persists, save your recordings (📖 159) and initialize the memory card (📖 43).

File name error

- The folder and file numbers have reached their maximum value. Set ⚙ ▸ 🔧 ▸ [File Numbering] to [Reset] and delete all the MP4 movies and photos (📖 79) on the memory card or initialize it (📖 43).

Initialize only using the camcorder

- There is a problem with the file system that prevents accessing the memory card. Initialize the memory card with this camcorder (📖 43).

LCD Screen has been dimmed Use the [LCD Backlight] setting to change the brightness

- Change the ⚙ ▸ 🔧 ▸ [LCD Backlight] setting to [Normal] or [Bright].

May not be possible to record movies on this memory card

- You may not be able to record movies on a memory card without a CLASS rating or with one rated CLASS 2. Replace the memory card with one rated CLASS 4, 6 or 10.

Memory card is full

- The memory card is full. Delete some recordings (📖 79) to free some space or replace the memory card.

Memory card is write-protected

- The LOCK switch on the memory card is set to prevent accidental erasure. Change the position of the LOCK switch.

Memory card writing error Attempt to recover the data?

- This message will appear the next time you turn on the camcorder if power supply was accidentally interrupted while the camcorder was writing to the memory card. Select [Yes] to try to recover the recordings. If you inserted a memory card that contains scenes recorded using another device, we recommend that you select [No].

Need to recover files from the memory card. Change the position of the LOCK switch on the memory card.

- This message will appear the next time you turn on the camcorder if power supply was accidentally interrupted while the camcorder was writing on the memory card and later the position of the card's LOCK switch was changed to prevent erasure. Change the position of the LOCK switch.

No memory card

- Insert a compatible memory card into the camcorder (📖 37).

- The memory card may not be inserted correctly. Insert the memory card all the way into the memory card slot until it clicks.

Not enough available space

- Delete some recordings on the memory card (📖 79) or select [4 Mbps] for the video quality when recording MP4 movies.

Number of scenes already at maximum

- The maximum number of AVCHD scenes (3,999 scenes) has been reached. Delete some scenes (📖 79) to free some space.

Recording was stopped due to insufficient write speed of the memory card

- The data transfer rate was too high for the memory card in use and the recording was stopped. Replace the memory card with one rated CLASS 4, 6 or 10.
- After repeatedly recording, deleting and editing scenes (fragmented memory), it will take longer to write data on the memory card and recording may stop. Save your recordings (📖 159) and initialize the memory card using the [Complete Initialization] option (📖 43).

Scene recorded using another device. Cannot divide the scene.

- Scenes that were not recorded with this camcorder cannot be divided with this camcorder.

- Scenes that were edited using software cannot be copied or divided.

Scene recorded using another device. Cannot play back the scene.

- Scenes that were not recorded with this camcorder cannot be played back.

Select the desired scene number

- A number of scenes have the same recording date but different file control information. This can occur for example when you record movies in the area of the international date line. Select a number to display the corresponding group of scenes.

Some scenes could not be deleted

- Movies that were protected/edited with other devices and then transferred to a memory card connected to the computer, cannot be deleted with this camcorder.

Task in progress. Do not disconnect the power source.

- The camcorder is updating the memory card. Wait until the operation ends and do not remove the battery pack.

This photo cannot be displayed

- You may not be able to display photos taken with other devices or image files created or edited on a computer and then transferred to a memory card connected to the computer.

To record video on this memory card, it is recommended to use [Long Play] video quality.

- When using a memory card rated CLASS 2, you may not be able to record movies using a video quality option other than 4 Mbps.

Too many photos and MP4 movies. Disconnect the USB cable.

- Disconnect the USB cable. Try using a memory card reader or decrease the number of photos and movies on the memory card to fewer than 2,500 (Windows), or 1,000 (Mac OS).
- If a dialog box appeared on the computer screen, close it. Disconnect the USB cable, and restore the connection after a short while.

Unable to recognize the data

- You transferred data to the camcorder recorded using a video configuration that is not supported (NTSC). Play back the recordings with the device originally used to record them.

Unable to recover data

- Could not recover a corrupted file. Save your recordings (📖 159) and initialize the memory card using the [Complete Initialization] option (📖 43).

List of Messages for Wi-Fi Functions

Refer also to the instruction manual of your access point and other devices you will use.

Another user is already controlling the camcorder. Try again later.

- This message appears on the screen of the Wi-Fi device. Multiple Wi-Fi devices are trying to connect with the camcorder. Make sure only one Wi-Fi device is trying to connect and then touch Retry.

Invalid port number. Perform the setting again.

- The port number entered cannot be used. In the settings for the Monitor while Out function (📖 181) change the port number to a port that does not conflict with other devices.

IP address conflict

- Change the camcorder's IP address to avoid any conflict with devices connected to the same network. Alternatively, change the IP address of the conflicting device.

Memory card cover is open

- The memory card cover was opened while the memory card was being accessed. Stop the Wi-Fi function in use and end the Wi-Fi connection.

Multiple access points detected. Try the operation again.

- There are multiple access points sending out a WPS signal at the same time. Try the operation again later or perform setup using the [WPS: PIN Code] or [Search for Access Points] option (📖 204).

No access points found

- The access point set in the camcorder could not be found.
- Cordless phones, microwave ovens, refrigerators and other appliances may interfere with the wireless signal. Try using the camcorder in a location farther away from such appliances.
- Make sure that you use the access point's SSID for the camcorder's Wi-Fi settings (📖 208).
- If the access point is using MAC address filtering, enter the camcorder's MAC address in the access point's configuration screen.

The access point is not compatible with UPnP

- An access point compatible with UPnP (Universal Plug and Play) was not found in the connected network. You must use an access point compatible with UPnP. If your access point is compatible, make sure UPnP is activated.

Unable to access configuration files

- Turn off the camcorder. After a short while, turn it on again. If the problem persists contact a Canon Service Center.

Unable to complete WPS.

- Turn off the camcorder and access point (wireless router). After a short while, turn them on again and try again. If the problem persists, perform setup using the [Search for Access Points] option (📖 204).

Unable to complete WPS. Try the operation again.

- Some access points require pressing and holding the Wi-Fi Protected Setup (WPS) button. For details, refer to the instruction manual of your access point.
- Make sure to touch [OK] on the camcorder's screen within 2 minutes of activating the Wi-Fi Protected Setup signal on the access point, whether by pressing the button or by entering the PIN code.

Unable to connect

- Cordless phones, microwave ovens, refrigerators and other appliances may interfere with the wireless signal. Try using the camcorder in a location farther away from such appliances.

Unable to connect to the server

- The camcorder could not access the external server used for the Monitor while Out function. Make sure the access point is correctly connected to the Internet.
- Check that [Date/Time] is set to the correct date and time.

Unable to obtain a global IP address.

- The access point to which the camcorder is connected has not been assigned a global IP address. Check the WAN settings of the broadband router to see if a global IP address has been assigned.
- Several wireless routers are connected to the same home network. Leave only one wireless router to serve as the access point.

Unable to obtain an IP address

- If you are not using a DHCP server, connect using the [Manual Setup] option and enter the IP address using the [Manual] option (📖 210).
- Turn on the DHCP server. If it is already on, make sure it is functioning properly.
- Make sure the address range for the DHCP server is sufficient.
- Turn on the DNS server. If it is already on, make sure it is functioning properly.
- Make sure that the DNS server's IP address and the name for that address are correctly configured.
- Set the DNS server's IP address in the camcorder.
- If you are not using a DNS server, set the DNS address to [0.0.0.0].

- If you are using a wireless gateway router, make sure all of the devices in the network, including the camcorder, are configured with the correct gateway address.

Wi-Fi authentication unsuccessful

- Make sure the camcorder and access point are using the same authentication/encryption method and encryption key.
- If the access point is using MAC address filtering, enter the camcorder's MAC address in the access point's configuration screen.

Wi-Fi cannot be used while the wireless microphone is attached

- The camcorder's Wi-Fi functions cannot be used while the optional WM-V1 Wireless Microphone is connected to the camcorder. Disconnect the microphone from the MIC terminal and turn it off.

Wi-Fi connection terminated

- Cordless phones, microwave ovens, refrigerators and other appliances may interfere with the wireless signal. Try using the camcorder in a location farther away from such appliances.
- The camcorder may not be able to connect to the access point if too many devices are accessing it. After a short while, establish the connection again.

Wi-Fi error. Incorrect authentication method.

- Make sure the camcorder and access point are correctly configured.
- Make sure the camcorder and access point are using the same authentication/encryption method and encryption key.
- If the access point is using MAC address filtering, enter the camcorder's MAC address in the access point's configuration screen.

Wi-Fi error. Incorrect encryption key.

- The encryption key (password) is case sensitive so make sure to enter it correctly.

Wi-Fi error. Incorrect encryption method.

- Make sure the camcorder and access point are using the same authentication/encryption method.
- If the access point is using MAC address filtering, enter the camcorder's MAC address in the access point's configuration screen.

Wireless communication is not working correctly

- Cordless phones, microwave ovens, refrigerators and other appliances may interfere with the wireless signal. Try using the camcorder in a location farther away from such appliances.

- Turn off the camcorder and access point (wireless router). After a short while, turn them on again and perform the Wi-Fi network setup again. If the problem persists contact a Canon Service Center.

List of Messages for Web Services

Camera Web Link is not set up

- An error occurred when transferring data with the CANON iMAGE GATEWAY server. Check the CANON iMAGE GATEWAY settings and try setting Camera Web Link again.

Check network settings

- An error occurred during authentication with the CANON iMAGE GATEWAY server. Make sure the date and time set in the camcorder are correct.

Insufficient space on server

- You have exceeded the amount of data you can save on the CANON iMAGE GATEWAY server. Delete some data to free some space.

Movie must be less than X min.

- You attempted to send a movie whose length exceeds the maximum length allowed by the Web service (the maximum length differs according to the Web service). Shorten the movie and try sending it again.

Server busy Try again later

- The CANON iMAGE GATEWAY server is busy due to a high number of users trying to connect to the server. End the Wi-Fi connection and try again later.

This image cannot be sent

- You attempted to send a type of recording or a file with a size that is not supported by the selected Web service. Check the recording before sending.

Try again

- An error occurred when transferring data with the CANON iMAGE GATEWAY server or the server is temporarily down. Try connecting the camcorder to the server again. If the same error occurs, wait a while and try again.

Unable to connect to the server

- The camcorder was not able to connect to the CANON iMAGE GATEWAY server. Connect the access point to which the camcorder is connected to the Internet.

Web service settings have been changed.

- The Web service settings for CANON iMAGE GATEWAY have been changed. Check the settings and try setting Camera Web Link again.

Handling Precautions

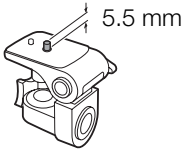
Camcorder

Be sure to observe the following precautions to ensure maximum performance.

- **Save your recordings periodically.** Make sure to transfer your recordings to an external device, such as a computer (📖 159), and save them on a regular basis. This will protect your important recordings in case of damage and create more free space on the memory card. Canon shall not be liable for any data loss.
- Do not carry the camcorder by the LCD panel. Be careful when closing the LCD panel.
- **Handle the touch screen with care.** Do not apply excessive force and do not use ballpoint pens or other hard-tipped tools to operate the touch screen. This may damage the touch screen’s surface.
- Do not allow contact with metallic objects. If metallic objects come in contact with the touch screen, this may inadvertently cause incorrect operation of the camcorder.

- Do not hold the camcorder in the same posture for long periods of times as this may cause low-temperature contact burns. Even if the camcorder does not feel too hot, prolonged contact with the same body part may cause skin redness or blistering. The use of a tripod is recommended for people with circulation problems or very sensitive skin, or when using the camcorder in very hot places.
- Do not leave the camcorder in places subject to high temperatures (like the inside of a car parked under direct sunlight), or high humidity.
- Do not use the camcorder near strong electromagnetic fields such as above TVs or near plasma TVs.
- Do not use the camcorder’s Wi-Fi functions inside hospitals, medical clinics or onboard aircraft. In addition, do not use them near medical equipment or sensitive electronic devices as it may affect their performance. In the case of pacemakers, keep the camcorder at least 22 cm away from the device.
- The camcorder’s Wi-Fi functions may be subject to interference from devices such as cordless phones and microwave ovens. Keeping as much distance as possible from these devices or using the camcorder’s Wi-Fi functions at a different time of day may reduce such interference.

- Do not point the camcorder toward an intense light source, such as the sun on a sunny day or an intense artificial light source. Doing so may damage the image sensor or the camcorder's internal components.
- Do not use or store the camcorder in dusty or sandy places. The camcorder is not waterproof – avoid also water, mud or salt. If any of the above should get into the camcorder it may damage the camcorder and/or the lens.
- Be careful of heat generated by lighting equipment.
- Do not disassemble the camcorder. If the camcorder does not function properly, consult qualified service personnel.
- Handle the camcorder with care. Do not subject the camcorder to shocks or vibration as this may cause damage.
- When mounting the camcorder on a tripod, make sure that the tripod’s fastening screw is shorter than 5.5 mm. Using other tripods may damage the camcorder.



- **When recording movies, try to get a calm, stable picture.** Excessive camcorder movement while shooting can result in jittery scenes. In extreme cases, the playback of such scenes may result in visually induced motion sickness. If you experience such a reaction, stop the playback immediately and take a rest break as necessary.

Long-Term Storage

If you do not intend to use the camcorder for a long time, store it in a place free of dust, in low humidity, and at temperatures not higher than 30 °C.

Battery Pack

DANGER!

Treat the battery pack with care.

- Keep it away from fire (or it might explode).
- Do not expose the battery pack to temperature higher than 60 °C. Do not leave it near a heater or inside a car in hot weather.
- Do not try to disassemble or modify it.
- Do not drop it or subject it to shocks.
- Do not get it wet.

- Dirty terminals may cause a poor contact between the battery pack and the camcorder or battery charger. Wipe the terminals with a soft cloth.

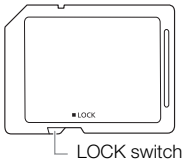
Long-Term Storage

- Store battery packs in a dry place at temperatures no higher than 30 °C.
- To extend the battery life of the battery pack, discharge it completely before storing it.
- Charge and discharge all your battery packs fully at least once a year.

Memory Card

- We recommend backing up the recordings on the memory card onto your computer. Data may be corrupted or lost due to memory card defects or exposure to static electricity. Canon shall not be liable for lost or corrupted data.
- Do not touch or expose the terminals to dust or dirt.
- Do not use memory cards in places subject to strong magnetic fields.
- Do not leave memory cards in places subject to high humidity and high temperature.

- Do not disassemble, bend, drop, or subject memory cards to shocks and do not expose them to water.
- Check the direction before inserting the memory card. Forcing a memory card into the slot if it is not correctly oriented may damage the memory card or the camcorder.
- Do not attach any labels or stickers on the memory card.
- When you delete movies or initialize the memory card, only the file allocation table is altered and stored data is not physically erased. When you dispose of the memory card or give it to another person, initialize the memory card using the [Complete Initialization] option (📖 43). Fill it up with unimportant recordings, and then initialize it again using the same option. This makes recovering the original recordings very difficult.
- Secure Digital (SD) memory cards have a physical switch to prevent writing on the card so as to avoid the accidental erasure of the card’s content. To write-protect the memory card set the switch to the LOCK position.



LOCK switch

Built-in Rechargeable Lithium Battery

The camcorder has a built-in rechargeable lithium battery to keep the date/time and other settings. The built-in lithium battery is recharged while you use the camcorder; however, it will discharge completely if you do not use the camcorder for about 3 months.

To recharge the built-in lithium battery: Connect the compact power adapter to the camcorder and leave it connected with the camcorder off. The built-in lithium battery will be fully charged after about 24 hours.

Maintenance/Others

Cleaning

Camcorder Body

- Use a soft, dry cloth to clean the camcorder body. Never use chemically treated cloths or volatile solvents such as paint thinner.

Lens

- Remove any dust or dirt particles using a non-aerosol type blower brush.
- Use a clean, soft lens-cleaning cloth to gently wipe the lens. Never use tissue paper.

LCD Touch Screen

- Clean the LCD touch screen using a clean, soft lens-cleaning cloth.
- Condensation may form on the surface of the screen when the temperature changes suddenly. Wipe it with a soft dry cloth.

Condensation

Moving the camcorder rapidly between hot and cold temperatures may cause condensation (water droplets) to form on its internal surfaces. Stop using the camcorder if condensation is detected. Continued use may damage the camcorder.

Condensation may form in the following cases:

- When the camcorder is moved quickly from cold to warm places
- When the camcorder is left in a humid room
- When a cold room is heated rapidly

To avoid condensation

- Do not expose the camcorder to sudden or extreme changes in temperature.
- Remove the memory card and battery pack. Then, place the camcorder in an airtight plastic bag and let it adjust gradually to temperature changes before removing it from the bag.

When condensation is detected

The precise time required for water droplets to evaporate will vary depending on the location and weather conditions. As a general rule, wait for 2 hours before resuming use of the camcorder.

Using the Camcorder Abroad

Power Sources

You can use the compact power adapter to operate the camcorder and to charge battery packs in any country with power supply between 100 and 240 V AC, 50/60 Hz. Consult a Canon Service Center for information on plug adapters for overseas use.

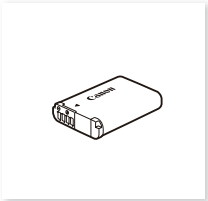
Playback on a TV Screen

You can only play back your recordings on TVs compatible with the PAL/SECAM system or 50-Hz digital TV broadcasts. These are used in the following regions/countries:

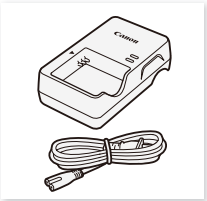
Europe: All of Europe and Russia. **Americas:** Only in Argentina, Brazil, Uruguay and French territories (French Guiana, Guadeloupe, Martinique, etc.). **Asia:** Most of Asia (except in Japan, the Philippines, South Korea, Taiwan and Myanmar). **Africa:** All of Africa and African islands. **Australia/Oceania:** Australia, New Zealand, Papua New Guinea; most Pacific islands (except for Micronesia, Samoa, Tonga and US territories like Guam and American Samoa).

Optional Accessories

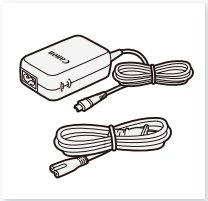
The following optional accessories are compatible with this camcorder but their availability may differ from area to area. Select accessories are described in more detail in the following pages.



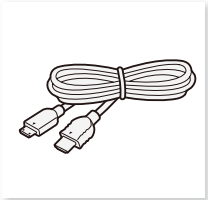
NB-12L Battery Pack



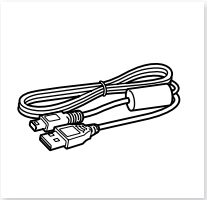
CB-2LGE Battery Charger



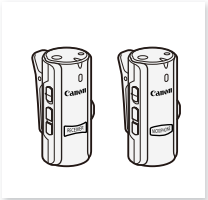
CA-110E Compact Power Adapter



HTC-100 High Speed HDMI Cable

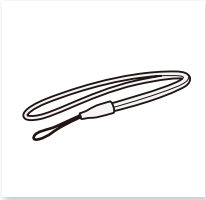


IFC-400PCU USB Cable



WM-V1 Wireless Microphone

CT-V1 Camera Pan Table



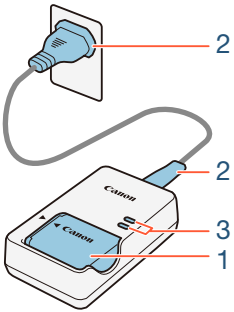
WS-DC11 Wrist Strap

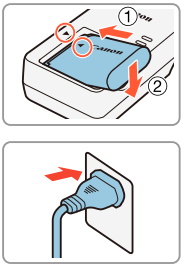
Use of genuine Canon accessories is recommended.
The message [Battery communication error] is displayed if you use a non-genuine Canon battery pack, and user response is required. Note that Canon shall not be liable for any damages resulting from accidents, such as malfunction or fire, that occur due to use of non-genuine Canon battery packs.

Battery Packs
When you need extra battery packs, use only the NB-12L.

CB-2LGE Battery Charger

You can charge the supplied battery pack using the optional battery charger. For details on charging times, refer to **Charging Times** (298).





Charging the Battery Pack

1. Attach the battery pack to the battery charger by inserting it at a downward angle, aligning the triangle marks.
2. Connect the power cord to the battery charger and plug the other end into a power outlet.
   - The indicator lights up in orange. When the indicator lights up in green, the battery pack is fully charged.
3. When the battery pack is fully charged, remove the battery pack from the battery charger and unplug the battery charger.

This mark identifies genuine Canon video accessories. When you use Canon video equipment, we recommend Canon-brand accessories or products bearing the same mark.

Specifications

LEGRIA mini X

♦ — Values given are approximate figures.

System

- **Recording System**

AVCHD[1] movies:
Video: MPEG-4 AVC/H.264
Audio: Linear PCM[2] 2ch, Dolby Digital 2ch

MP4 movies:
Video: MPEG-4 AVC/H.264
Audio: MPEG-4 AAC-LC (2ch)

Photos:
DCF (Design rule for Camera File system), compatible with Exif[3] Ver. 2.3
Image compression: JPEG

1 Compatible with AVCHD ver. 2.0 specifications.
2 Linear PCM is available only when the video quality is 24 Mbps.
3 This camcorder supports Exif 2.3 (also called “Exif Print”). Exif Print is a standard for enhancing the communication between camcorders and printers. By connecting to an Exif Print-compliant printer, the camcorder’s image data at the time of shooting is used and optimized, yielding extremely high quality prints.

- **Video Signal Configuration:** AVCHD, MP4
- **Recording Media**
  SD, SDHC (SD High Capacity) or SDXC (SD eXtended Capacity) memory card (not included)
- **Maximum Recording Time**♦
  Commercially available 16 GB memory card
  24 Mbps: 1 hr. 25 min.
  17 Mbps: 2 hr. 5 min.
  4 Mbps: 8 hr. 40 min.
  Commercially available 32 GB memory card
  24 Mbps: 2 hr. 55 min.
  17 Mbps: 4 hr. 10 min.
  4 Mbps: 17 hr. 20 min.

- **Image Sensor**
  1/2.3-type CMOS, 12,800,000 pixels♦
  Effective pixels (ultra wide) ♦:
  8,290,000 pixels (AVCHD movies)
  8,990,000 pixels (MP4 movies)
  12,000,000 pixels (photos)
  Effective pixels (close-up) ♦:
  1,330,000 pixels (AVCHD movies, when [Image stabilizer] is [On])
  2,070,000 pixels (AVCHD movies, when [Image stabilizer] is [Off])
  2,070,000 pixels (MP4 movies)
  2,760,000 pixels (photos)
- **LCD Touch Screen**
  6.8 cm (2.7 in.), TFT color, 230,000 dots♦, capacitive touch screen operation, 100% coverage
- **Microphone**
  Stereo electret condenser microphone

- **Lens**
  f=2.7 mm, F/2.8
  35mm-equivalent focal length (ultra wide) ♦:
  17.5 mm (AVCHD movies)
  16.8 mm (MP4 movies)
  15.4 mm (photos)
  35mm-equivalent focal length (close-up) ♦:
  43.7 mm (AVCHD movies, when [Image stabilizer] is [On])
  35.0 mm (AVCHD movies, when [Image stabilizer] is [Off])
  35.0 mm (MP4 movies)
  32.1 mm (photos)
- **Lens Configuration**
  6 elements in 5 groups (1 double-sided aspheric element)
- **Focusing Distance**
  Deep focus, 0.4 m to infinity
- **White Balance**
  Auto white balance, Custom white balance or Preset white balance settings: [Daylight], [Tungsten]
- **Minimum Illumination**
  8 lx ([Programmed AE] shooting mode, Shutter speed at 1/25)
- **Recommended Illumination:** More than 100 lx

- **Image Stabilization:** Electronic
- **Size of Video Recordings**
  24 Mbps, 17 Mbps: 1920 x 1080 pixels
  4 Mbps: 1280 x 720 pixels
  3 Mbps: 640x360 (only during [x1/4] slow motion)
- **Size of Photos**
  L 4000x3000 pixels, **M** 1920x1440 pixels, **S** 640x480 pixels
  Photos captured from movies: 1920x1080 pixels

Terminals

- **USB Terminal:** mini-B, Hi-Speed USB; output only
- **HDMI Terminal:** HDMI Mini Connector; output only
- **MIC Terminal**
  ∅ 3.5 mm stereo minijack
  –64 dBV (with 600 Ω microphone) / 5 kΩ or more
- **🎧 (headphones) terminal**
  ∅ 3.5 mm minijack, stereo output

Wi-Fi

- **Standard**
  Complies with the IEEE 802.11b/g/n protocol; Wi-Fi Protected Setup (connection methods: WPS button, PIN code)
- **Frequency:** 2.4 GHz

- **Supported channels:** 1 - 13
- **Encryption methods:** WEP-64/WEP-128, TKIP/AES

Power/Others

- **Power supply (rated)**
  3.6 V DC (battery pack), 5.3 V DC (compact power adapter)
- **Power consumption (17 Mbps video quality, normal brightness)♦**
  AVCHD movies: 2.4 W
  MP4 movies: 2.2 W
- **Operating temperature♦:** 0 – 40 °C
- **Dimensions♦ [W x H x D] (excluding the wrist strap)**
  82 x 30 x 109 mm
- **Weight♦ (camcorder body only)**
  205 g

NB-12L Battery Pack

- **Battery type**
  Rechargeable lithium ion battery
- **Rated voltage:** 3.6 V DC
- **Operating temperature♦:** 0 – 40 °C

- **Battery capacity:** 1910 mAh (typical)
- **Dimensions♦:** 34.4 x 48.5 x 10.4 mm
- **Weight♦:** 35 g

CA-110E Compact Power Adapter

- **Power supply:** 100 - 240 V AC, 50/60 Hz
- **Rated output / consumption**
  5.3 V DC, 1.5 A / 17 VA (100 V) - 23 VA (240 V)
- **Operating temperature♦:** 0 - 40 °C
- **Dimensions♦:** 49 x 27 x 79 mm
- **Weight♦:** 110 g

Weight and dimensions are approximate. Errors and omissions excepted.
The information in this manual is verified as of April 2015. Specifications and outer appearance are subject to change without previous notice.

Reference Tables

Approximate recording times

Memory card	Video quality (Resolution)		
	24 Mbps (1920x1080)	17 Mbps (1920x1080)	4 Mbps[1] (1280x720)
8 GB	40 min.	1 hr.	4 hr. 20 min.
16 GB	1 hr. 25 min.	2 hr. 5 min.	8 hr. 40 min.
32 GB	2 hr. 55 min.	4 hr. 10 min.	17 hr. 20 min.[2]
64 GB	5 hr. 55 min.	8 hr. 20 min.	34 hr. 45 min.[2]

[1] For MP4 movies only.

[2] A single scene can be recorded continuously for 12 hours; at that point, the camcorder will stop for about 3 seconds. After that, recording will continue as a separate scene.

Approximate number of photos available on a 4 GB memory card

The numbers given in the following table are approximate and vary according to recording conditions and the subject.

♦ Default value

Photo size	Number of photos
[**L** 4000x3000]♦	750
[**M** 1920x1440]	3,200
[**S** 640x480]	23,500

Charging Times

The charging times given in the following table are approximate and vary according to charging conditions and initial charge of the battery pack.

Charging conditions	Charging time
Using the camcorder	240 min.
Using the CB-2LGE Battery Charger	185 min.

Approximate Usage Times

Recording and playback times given in the following table are approximate and vary according to video quality and charging, recording or playback conditions. The effective usage time of the battery pack may decrease when recording in cold surroundings, when using the brighter screen settings, etc.

Recording AVCHD movies

Video quality	Recording (maximum)	Recording (typical)*	Playback
24 Mbps	165 min.	95 min.	225 min.
17 Mbps	165 min.	95 min.	225 min.

Recording MP4 movies

Video quality	Recording (maximum)	Recording (typical)*	Playback
24 Mbps	180 min.	100 min.	230 min.
17 Mbps	180 min.	100 min.	225 min.
4 Mbps	190 min.	110 min.	240 min.

* Approximate times for recording with repeated operations such as start/stop, and power on/off.

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EUROPE

Canon Europa N.V.
Bovenkerkerweg 59, 1185 XB Amstelveen, The Netherlands
www.canon-europe.com

UNITED KINGDOM

Canon UK Ltd, CCI Service Centre, Unit 130
Centennial Park, Borehamwood, Hertfordshire, WD6 3SE, United Kingdom
Telephone 0844-369-0100

AUSTRALIA

Canon Australia Pty Ltd
Tel: 13-13-83 (within Australia only), (61) 02-9805-2555
www.canon.com.au

NEW ZEALAND

Canon New Zealand Ltd
Tel: 0800-222-666 (within New Zealand only), (64) 09-489-0300
www.canon.co.nz

SINGAPORE

Canon Singapore Pte. Ltd
1 HarbourFront Avenue, #04-01 Keppel Bay Tower, Singapore 098632
Tel: (65) 6799 8888, Fax: (65) 6799 8882

HONG KONG S.A.R.

Canon Hongkong Company Ltd
19/F, The Metropolis Tower, 10 Metropolis Drive, Hunghom, Kowloon, Hong Kong
Tel: +852 3191 2333, Fax: +852 2428 3963

CENTRO Y SURAMÉRICA

Canon Latin America, Inc.
Sales & Enquiries: One Canon Park, Melville, NY 11747 USA

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PUB. DIE-0455-000C
30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501, Japan